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DOE/MA-0064/4
Volume 7 of 7

Congressional Budget Request

Energy Conservation
Strategic Petroleum Reserve
Emergency Preparedness
Energy Regulation
Energy Information Administration

Volume 7

FY 1987

U.S. Department of Energy
Assistant Secretary,
Management and Administration
Office of the Controller

February 1986

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DOE/MA-0064/4
Volume 7 of 7

Congressional Budget Request

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Strategic Petroleum Reserve
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Volume 7

FY 1987

U.S. Department of Energy
Assistant Secretary,
Management and Administration
Office of the Controller
Washington, D.C. 20585

February 1986

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DEPARTMENT OF ENERGY

FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST

ENERGY CONSERVATION

STRATEGIC PETROLEUM RESERVE

EMERGENCY PREPAREDNESS

ENERGY REGULATION

ENERGY INFORMATION ACTIVITIES

VOLUME 7

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DEPARTMENT OF ENERGY

FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF ESTIMATES BY APPROPRIATIONS

(in thousands of dollars)

	FY 1985 Actual BA	FY 1986 Estimate BA	FY 1987 Request BA
Appropriations Before The Energy and Water Development Subcommittees:			
Energy Supply Research and Development	1,967,490	1,696,298	1,254,162
Uranium Enrichment	237,956	190,512	---
General Science and Research	724,860	655,928	773,400
Atomic Energy Defense Activities	7,322,321	7,231,664	8,230,000
Departmental Administration	128,602	150,319	151,082
Alaska Power Administration	3,233	3,245	2,881
Bonneville Power Administration	284,771	330,000	276,100
Southeastern Power Administration	35,744	---	19,647
Southwestern Power Administration	31,208	29,191	25,337
Western Area Power Administration	218,230	195,910	240,309
Western Area Power Emergency Fund	---	---	---
Federal Energy Regulatory Commission	54,543	41,989	20,325
Nuclear Waste Fund	327,669	499,037	769,349
Geothermal Resources Development Fund	121	69	72
Subtotal, Appropriations Before the Energy and Water Development Subcommittees	$11,336,748	$11,024,162	$11,762,664

DEPARTMENT OF ENERGY

FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF ESTIMATES BY APPROPRIATIONS

(in thousands of dollars)

	FY 1985 Actual BA	FY 1986 Estimate BA	FY 1987 Request BA
Appropriations Before Interior and Related Agencies Subcommittees:			
Alternative Fuels Production	$ 1,169,895	$ ---	$ ---
Clean Coal Technology	---	---	---
Fossil Energy Research and Development	289,048	311,954	82,767
Naval Petroleum and Oil Shale Reserves	156,874	13,002	127,108
Energy Conservation	457,436	427,512	39,433
Energy Regulation	27,139	23,423	21,850
Emergency Preparedness	6,045	5,750	6,044
Strategic Petroleum Reserve	2,049,550	107,533	---
Energy Information Activities	60,919	57,724	59,651
Subtotal, Interior and Related Agencies Subcommittees	4,216,906	946,898	336,853
Subtotal, Energy and Water Development Subcommittees	11,336,748	11,024,162	11,762,664
Subtotal, Department of Energy	15,553,654	11,971,060	12,099,517
Permanent - Indefinite Appropriations:			
Payments to States	1,052	570	570
Total, Department of Energy	$15,554,706	$11,971,630	$12,100,087

Department of Energy
F Y 1987 Congressional Staffing Request
Total Work Force

	FY1985 FTE USAGE	FY1986 CONGR REQ	FY1987 -FY86	FY1987 CONGR REQ
ENERGY & WATER SUBCOMMITTEE				
HEADQUARTERS	4,865	4,965	-18	4,947
FIELD	9,133	9,185	111	9,296
SUBCOMMITTEE TOTAL	13,998	14,150	93	14,243
INTERIOR SUBCOMMITTEE				
HEADQUARTERS	1,353	1,304	-166	1,138
FIELD	907	896	-226	670
SUBCOMMITTEE TOTAL	2,260	2,200	-392	1,808
GRAND TOTAL	16,258	16,350	-299	16,051
ADJUSTMENT		-132	-198	-330
ADJUSTED TOTAL	16,258	16,218	-497	15,721

Department of Energy
F Y 1987 Congressional Staffing Request
Total Work Force

	FY1985 FTE USAGE	FY1986 CONGR REQ	FY1987 -FY86	FY1987 CONGR REQ
10:ENERGY SUPPLY RESEARCH AND DEV	937	934	-34	900
HEADQUARTERS	811	820	-28	792
FIELD	126	114	-6	108
15:URANIUM ENRICHMENT	69	66	1	67
HEADQUARTERS	58	55	1	56
FIELD	11	11	0	11
20:GENERAL SCIENCE AND RESEARCH	37	39	0	39
HEADQUARTERS	37	39	0	39
25:ATOMIC ENERGY DEFENSE ACTIVITI	2,618	2,702	131	2,833
HEADQUARTERS	496	518	9	527
FIELD	2,122	2,184	122	2,306
30:DEPARTMENTAL ADMINISTRATION	3,307	3,332	-5	3,327
HEADQUARTERS	1,721	1,726	0	1,726
FIELD	1,586	1,606	-5	1,601
34:ALASKA POWER ADMINISTRATION	37	38	0	38
FIELD	37	38	0	38
36:BONNEVILLE POWER ADMIN	3,510	3,480	0	3,480
FIELD	3,510	3,480	0	3,480
38:SOUTHEASTERN POWER ADMIN	38	40	0	40
FIELD	38	40	0	40
42:SOUTHWESTERN POWER ADMIN	186	186	0	186
FIELD	186	186	0	186
46:WESTERN AREA POWER ADMIN	1,181	1,160	0	1,160
FIELD	1,181	1,160	0	1,160
50:WAPA - COLORADO RIVER BASIN	219	219	0	219
FIELD	219	219	0	219
52:FEDERAL ENERGY REGULATORY COMM	1,617	1,659	0	1,659
HEADQUARTERS	1,617	1,659	0	1,659
54:NUCLEAR WASTE FUND	238	292	0	292
HEADQUARTERS	123	147	0	147
FIELD	115	145	0	145
56:GEOTHERMAL RESOURCES DEV FUND	2	1	0	1
HEADQUARTERS	2	1	0	1
65:FOSSIL ENERGY RESEARCH AND DEV	714	700	-161	539
HEADQUARTERS	151	135	-26	109
FIELD	563	565	-135	430
70:NAVAL PETROL & OIL SHALE RES	104	104	-9	95
HEADQUARTERS	23	23	0	23
FIELD	81	81	-9	72
75:ENERGY CONSERVATION	333	352	-134	218
HEADQUARTERS	208	227	-79	148
FIELD	125	125	-55	70
80:EMERGENCY PREPAREDNESS	74	71	0	71
HEADQUARTERS	74	71	0	71
81:ECONOMIC REGULATION	377	340	-50	290
HEADQUARTERS	377	340	-50	290
85:STRATEGIC PETROLEUM RESERVE	178	152	-32	120
HEADQUARTERS	40	27	-5	22
FIELD	138	125	-27	98
90:ENERGY INFORMATION ACTIVITIES	480	481	-6	475
HEADQUARTERS	480	481	-6	475
94:ADVANCES FOR CO-OP WORK	2	2	0	2
FIELD	2	2	0	2
GRAND TOTAL	16,258	16,350	-299	16,051
ADJUSTMENT		-132	-198	-330
ADJUSTED TOTAL	16,258	16,218	-497	15,721

DEPARTMENT OF ENERGY

FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST

ENERGY CONSERVATION

VOLUME 7

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DEPARTMENT OF ENERGY

Proposed Appropriation Language

Energy Conservation

For necessary expenses in carrying out energy conservation activities, [$449,418,000] $39,433,000, to remain available until expended: Provided, That [pursuant to section 111(b)(1)(B) of the Energy Reorganization Act of 1974, as amended, 42 U.S.C. 5821(b)(1)(B), of the amount appropriated under this head, $10,319,000 shall be available] of the amounts appropriated under this head in Public Law 99-190, funds available for a grant for basic industry research facilities located at Northwestern University [without section 111(b)(2) of such Act being applicable: Provided further, That section 404 of Public Law 98-558 shall not be effective in any fiscal year in which the amount made available for low income weatherization assistance from appropriations under this head is less than 5 per centum above the amount made available in fiscal year 1985: Provided further, That $7,500,000 of the amount provided under this heading shall be available for a research and development initiative with the national laboratories for new technologies up to proof-of-concept testing to increase significantly the energy efficiency of processes that produce steel: Provided further, That obligation of funds for these activities shall be contingent on an agreement to provide cash or in-kind contributions to the initiative or to other collaborative research and development activities related to the purpose of the initiative equal to 30 percent of the amount of Federal government obligations. Provided further, That existing facilities, equipment, and supplies, or previously expended research or development funds are not acceptable as contributions for the purposed of this appropriation, except as amortized, depreciated, or expensed in normal business practice: Provided, further, That the total Federal expenditure under this proviso shall be repaid up to one and one-half times from the proceeds of the commercial sale, lease, manufacture, or use of technologies developed under this proviso, at a rate of one-fourth of all net proceeds] and funds available for a research and development initiative with the national laboratories for energy-efficient steel production technologies shall be available for other expenses of energy conservation activities. (Department of the Interior and Related Agencies Appropriations Act, 1986, as included in Public Law 99-190.)

ADDITIONAL ADMINISTRATIVE PROVISION -- DEPARTMENT OF ENERGY

Any statutory provisions requiring the maintenance of full-time permanent Federal employees, or prohibiting actions to reduce employment levels, or otherwise establishing requirements for personnel levels of the Department of Energy or any of its offices or activities, are hereby repealed.

DEPARTMENT OF ENERGY

FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF ESTIMATES BY APPROPRIATION BY MAJOR ACTIVITY

ENERGY CONSERVATION

BUDGET AUTHORITY IN THOUSANDS OF DOLLARS

	FY 1985 Actual	FY 1986 Estimate	FY 1987 Request
Transportation	61,341	56,637	19,800
Industrial	31,706	40,096	15,623
Buildings and Community Systems	41,025	37,280	14,150
Multi-Sector	23,791	25,574	19,850
Facilities	15,681	9,608	---
Subtotal, Conservation R&D	173,544	169,195	69,423
State and Local	283,400	256,630	5,000
Policy and Management	1,747	1,687	1,792
Policy Analysis	245	---	---
Subtotal, Energy Conservation	458,936	427,512	76,215
Use of Prior Year Balances	-1,500	---	---
Use of FY 86 Deferral-(CE)EC	---	---	-36,782
Total, Energy Conservation	$457,436	$427,512	$ 39,433

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE
ENERGY CONSERVATION
(Tabular dollars in thousands. Narrative material in whole dollars.)

	FY 1985 Approp.	FY 1986 Approp.	FY 1987 Base	FY 1987 Request	Request vs Base
Buildings and Community Systems					
Operating Expenses:					
R&D Activities	36,905	31,860	31,860	11,750	(20,110)
Program Direction	2,895	3,557	3,557	2,400	(1,157)
Subtotal Operating	39,800	35,417	35,417	14,150	(21,267)
Capital Equipment	1,225	1,863	1,863	0	(1,863)
Total Buildings and Community Systems	41,025	37,280	37,280	14,150	(23,130)
Staffing, FTEs	57	71	71	45	(26)
Industrial Energy Conservation					
Operating Expenses:					
R&D Activities	27,743	38,080	38,080	13,779	(24,301)
Program Direction	1,807	2,016	2,016	1,844	(172)
Subtotal Operating	29,550	40,096	40,096	15,623	(24,473)
Capital Equipment	2,156	0	0	0	0
Total Industrial Energy Conservation	31,706	40,096	40,096	15,623	(24,473)
Staffing, FTEs	33	35	35	26	(9)
Transportation					
Operating Expenses:					
R&D Activities	56,488	51,693	51,693	18,400	(33,293)
Program Direction	1,913	2,140	2,140	1,400	(740)
Subtotal Operating	58,401	53,833	53,833	19,800	(34,033)
Capital Equipment	2,940	0	0	0	0
Plant	0	2,804	2,804	0	(2,804)
Subtotal Plant & Capital Equipment	2,940	2,804	2,804	0	(2,804)
Total Transportation	61,341	56,637	56,637	19,800	(36,837)
Staffing, FTEs	33	36	36	22	(14)

	FY 1985 Approp.	FY 1986 Approp.	FY 1987 Base	FY 1987 Request	Request vs Base
Multi-Sector					
Operating Expenses:					
R&D Activities	21,833	24,146	24,146	19,250	(4,896)
Program Direction	292	498	498	500	2
Subtotal Operating	22,125	24,644	24,644	19,750	(4,894)
Capital Equipment	1,666	930	930	100	(830)
Total Multi-Sector	23,791	25,574	25,574	19,850	(5,724)
Staffing, FTEs	4	9	9	8	(1)
State and Local					
Operating Expenses:					
Grants/Program Activities	273,439	247,105	247,105	0	(247,105)
Program Direction	9,961	9,525	9,525	5,000	(4,525)
Total State and Local	283,400	256,630	256,630	5,000	(251,630)
Staffing, FTEs	178	180	180	100	(80)
Policy and Management					
Operating Expenses	1,747	1,687	1,687	1,792	105
Staffing, FTEs	28	21	21	17	(4)
Policy Analysis					
Operating Expenses	245	0	0	0	0
Facilities					
Plant	15,681	9,608	9,608	0	(9,608)
Operating Expenses	435,268	412,307	412,307	76,115	(336,192)
Capital Equipment	7,987	2,793	2,793	100	(2,693)
Plant	15,681	12,412	12,412	0	(12,412)
Total Energy Conservation	458,936	427,512	427,512	76,215	(351,297)
Total FTEs	333	352	352	218	(134)

FY 1987 Congressional Budget
MAJOR ACTIVITY OVERVIEW
Energy Conservation

Energy conservation continues to play an important role in improving the nation's energy and economic efficiency. Conservation has come chiefly from increased efficency in the use of energy and from a shift in the Nation's mix of goods and services towards less energy intensiveness. Between 1973 and 1984, the amount of energy required to produce a constant dollar of gross national product declined by 24 percent; for the last two years alone there was a five percent improvement. Total energy consumption in 1984 was actually less than in 1973, and far below what would have been projected had pre-1973 trends continued. The decline among certain energy-intensive industries, played a role in reducing energy consumption during this 10-year period, but improvements in energy efficiency alone are estimated to account for more than 29 quads of cumulative energy savings since 1973.

The residential sector has shown a very sharp decrease in energy use per household compared with earlier habits and trends, contributing almost 40 percent to the 29-quad total savings achieved by the overall economy in comparison with pre-1973 trends. Better insulated houses, improved appliance efficiency, and changes in household behavior have helped.

Within the industrial sector, improvements in energy efficiency account for approximately 30 percent of the economy-wide savings. Improved industry practices and changes in the industrial production mix have both been major contributors, with the former providing most of the gain.

The commercial sector has contributed about 20 percent of the 29-quad savings through improvements in building design, lighting, refrigeration, energy storage, and computerized management of energy use.

In the transportation sector, increased auto and truck efficiency has been coupled with improved airline technical and operating efficiency to reduce energy used per mile of passenger or freight movement. This contributed the final 10 percent to the total savings, as compared to pre-1973 trends.

Because it takes time for proven conservation technologies to be adopted by both sellers and buyers, we have not yet by any means seen the total impact of conservation decisions made following the oil disruptions of the 1970's.

There are strong reasons to expect continued improvements in energy use efficiency. Conservation actions by industry often are tied directly to efforts to improve productivity and competitiveness. Even at today's lower energy prices, many more cost-effective improvements remain to be made in new cars, homes, commercial buildings, and industrial equipment. The continuing development and introduction of new technology will increase the efficiency of performance and broaden the range of conservation options available in the marketplace.

While efficiency continues to improve, total U.S. energy consumption rose during 1984 for the first time in 5 years. This increase, to 74 quads, represents a rise of about 4 percent from 1983 levels. This increase is attributed, in part, to the Nation's increasing economic growth, which expanded to 7 percent in 1984, and to declining prices, which made conservation actions seem less economically attractive and softened attitudes towards the benefits of conservation. This rise in total energy consumption serves as a reminder that conservation must continue to play a prominent role in national energy policy to ensure the Nation's long-term energy security and economic well-being.

Many important opportunities remain to reduce future energy demands cost-effectively through innovation and the introduction and commercial application of advanced, highly efficient, energy-related technologies. A doubling of our efficiency gains over the past decade (in percentage terms) is probably economically feasible by the year 2010, even if current energy prices remain stable or experience a moderate decline. This will not require large government outlays. As conservation takes hold, it does so by being the most cost-effective of all energy options in a great variety of circumstances within all energy consuming sectors.

The Energy Conservation section of the Congressional Budget includes two major program areas, Conservation Research and Development and the State and Local Assistance Programs.

MISSION AND OBJECTIVES OF ENERGY CONSERVATION RESEARCH AND DEVELOPMENT

The mission of the Conservation Research and Development Program is to encourage the full development of energy conservation's potential and to provide a robust array of technology options for that will strengthen the technology base on which industry can draw in developing future new products and processes for the commercial market.

Accordingly, the program carries out a broad range of activities, each designed to contribute in a significant way to the technical and economic environment necessary to support this development. These activities focus primarily on basic and applied research, technology development, technical assistance, and information activities. They also include energy management within the federal establishment, and the development of guidelines and standards where required by law.

The objectives of the R&D activities are to: (1) improve the efficiency by which resources are used in the economy, focusing on energy (and thereby improving the competitiveness of energy-intensive industries); (2) increase the flexibility and diversity of available energy end-use technologies, focusing in particular on alternatives to those currently based exclusively on one form of energy, such as petroleum in transportation; (3) ensure the resiliency and reliabiility of energy end-use systems; and (4) understand the health and safety implications of conservation related technologies.

The focus of energy conservation is on improving the efficiency of energy use; therefore, the Conservation Research and Development Program is organized basically by energy-using sectors of the economy. These include residential and commercial buildings and community systems, transportation, and industry. Energy use in 1985 was distributed about evenly among these three sectors. In addition to these categories, there are many technologically related aspects of energy use which are common to all sectors of the economy. Combustion is one example, friction and wear is another, and the use of advanced materials in energy related equipment and high-temperature environments is a third. Hence, a fourth element of the Conservation R&D program addresses the cross-cutting aspects of energy use. This fourth multi-sector element of the program also serves as the clearinghouse for innovative concepts and inventions originating in the private sector.

In FY 1987, the Conservation Research and Development Program will carry out activities in the following budget categories:

- Buildings and Community Systems
- Industrial Programs
- Transportation
- Multi-Sector

Reductions in the Energy Conservation R&D programs are proposed in the 1987 budget consistent with budgetary constraints and the stability of our near and mid term energy supply and demand forecasts. Although provisions have been made to satisfy the requirements of the statutory programs, it is planned that legislation will be introduced to eliminate regulatory requirements that conflict with a free-market approach to providing conservation signals to energy users.

One of the primary goals of all the applied research areas in Conservation is to effectively transfer technology from Federal and university laboratories to private industry. The earlier industry is involved, and the more directly that the research agenda is guided by the companies' own economic self-interest, the more effective the transfer is likely to be. A funding approach will be explored in 1987 as an effort to increase the private leverage of Federal funds, provide industry involvement in the choice of technology development directions, and help limited Federal funds to support emerging industry more broadly. This approach is to solicit industry interest in joining together to form cooperative R&D ventures within broad sectors of the economy. This ultimately could transform most or all of the industry-performed work in Conservation, and can facilitate transfer of advanced technology to the private sector. Most areas of industry-performed Conservation R&D work offer excellent opportunities for this approach.

Cooperative ventures are potentially suited to this technology-transfer/proof-of-concept stage of activity. By law, and because of the competitive interests of the companies involved, their activity is restricted to pre-competitive (i.e., not product-specific) research and development. The cooperative ventures would be designed to meet this criterion. This matches Administration policy of supporting longer-term generic research that benefits the public, but not using tax dollars to subsidize a particular company's development of proprietary products. Support of industry-cooperative R&D allows limited Federal funds to strengthen a whole industry and not just one or a few selected players. This can clearly benefit emerging industries as well as more mature ones.

The voluntary organization of such cooperative ventures by industry would serve as a strong indicator for the proper direction of government-sponsored R&D. The pooled funding will also provide a greater degree of private cost-sharing for applied R&D, allowing Federal dollars to go farther.

If the cooperative venture is defined broadly, with a substantial membership base and level of funding, it can perform or sponsor technology development projects in a number of related areas. This serves to further reduce the risk to the participants, ensuring better chances for shared successes that will repay each party's investment.

The Department will not place tight constraints on the types of cooperative opportunities to be considered, but key characteristics of the concept include:

- Significant leveraging of Federal funding;
- The support that the Department would provide should not displace support that would otherwise come from the private sector;
- The Federal government will share in royalties or other repayment profits from the venture, proportionate to its constribution to the venture;
- Participation of two or more companies;
- Preferably ventures should include companies that have previously proven themselves successful in obtaining and managing co-funding from private sources.

As industry develops responses to this opportunity, the Department will consider reprogramming of monies to allow participation in promising cooperative ventures.

FY 1987 Congressional Budget
DECISION UNIT OVERVIEW
Buildings and Community Systems

Energy conservation in the buildings sector continues to make a significant contribution to the nation's improved energy situation. Energy consumption in buildings has been reduced 20 percent per unit of floor space since 1972 and we expect this trend to continue. Since the buildings sector uses approximately one-third of the energy consumed by our economy, such conservation may be viewed as a significant energy resource. Consequently, improved building energy efficiency is an important element of a balanced and diverse energy resource system.

The mission of the Buildings and Community Systems program is to encourage full development of the potential for economical energy conservation in residential and commercial buildings. Accordingly, program activities focus on research to advance the technologies needed for private sector development of energy efficient buildings, building equipment, and building energy supply systems. Other activities include transfer of the results of this research to industry and consumers, implementation of Congressionally mandated building energy conservation programs, and coordination of the Federal government's "in-house" energy conservation activities.

In FY 1987 the Buildings and Community Systems program will carry out activities in the following subprograms.

- o Building Systems
- o Technology and Consumer Products
- o Analysis and Technology Transfer
- o Appliance Standards
- o Federal Energy Management Program

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE
ENERGY CONSERVATION
BUILDINGS AND COMMUNITY SYSTEMS
(Tabular dollars in thousands. Narrative material in whole dollars.)

	FY 1985 Approp.	FY 1986 Approp.	FY 1987 Base	FY 1987 Request	Request vs Base
Buildings and Community Systems					
Building Systems	$14,560	$12,099	$12,099	$ 3,500	$ -8,599
Community Systems	5,390	3,727	3,727	0	-3,727
Urban Waste	980	0	0	0	0
Technology and Consumer Products	9,997	10,053	10,053	5,000	-5,053
Analysis and Technology Transfer	980	2,559	2,559	1,000	-1,559
Appliance Standards	2,450	1,863	1,863	1,200	-663
Federal Energy Management Program	1,274	1,187	1,187	1,050	-137
Residential Conservation Service	1,274	372	372	0	-372
Program Direction	2,895	3,557	3,557	2,400	-1,157
Subtotal					
Operating Expenses	39,800	35,417	35,417	14,150	-21,267
Capital Equipment	1,225	1,863	1,863	0	- 1,863
Total Buildings and Community Systems	$41,025	$37,280	$37,280	$14,150	$-23,130
Staffing Total FTE's	57	71	71	45	-26

Authorization: P.L. 93-577, as amended, Energy Research and Development Act
P.L. 94-163, Part E (Sec. 381), Energy Policy and Conservation Act
P.L. 94-385, Energy Conservation and Production Act
P.L. 94-438, Energy Reorganization Act of 1974
P.L. 95-618, (Title I), Energy Tax Act
P.L. 95-619, (Sec. 224, Parts 1, 2, 4; Sec. 210-223; and Sec. 501, 541-551), National Energy Conservation Policy Act
P.L. 95-620, Power Plant and Industrial Fuel Use Act of 1978
P.L. 96-294, Energy Security Act
RCS: National Energy Conservation Policy Act, as amended by Energy Security Act;
CACS: Energy Security Act

Department of Energy

FY 1987 Congressional Budget Request

Adjustments to FY 1986 Appropriations

	FY 1986 Conference	General Reduction	Management Initiatives	Pay Cost Restoration	Gramm-Rudman-Hollings Reduction	Adj. Approp. Total
Buildings & Community Systems						
Building Systems	$13,000	$ -78	$ -280	$ ---	$ -543	$12,099
Community Systems	4,000	-20	-86	---	-167	3,727
Residential Conservation Service	400	-2	-9	---	-17	372
Technology & Consumer Products	10,800	-63	-232	---	-452	10,053
Appliance Standards	2,000	-10	-43	---	-84	1,863
Analysis & Technology Transfer	2,750	-17	-59	---	-115	2,559
Federal Energy Management Program	1,275	-8	-27	---	-53	1,187
Capital Equipment	2,000	-10	-43	---	-84	1,863
Program Direction	3,200	-19	-82	618	-160	3,557
Subtotal, Buildings and Community Systems	$39,425	$ -227	$ -861	$ 618	$-1,675	$37,280
General Reduction:						
Operating Expenses.....	$ -217	$ 217	$ ---	$ ---	$ ---	$ ---
Capital Equipment	-10	10	---	---	---	---
Total, General Reduction	$ -227	$ +227	$ ---	$ ---	$ ---	$ ---
Management Initiatives:						
Operating Expenses.....	$ -818	$ ---	$ 818	$ ---	$ ---	$ ---
Capital Equipment	-43	---	43	---	---	---
Total, Management Initiatives	$ -861	$ ---	$ 861	$ ---	$ ---	$ ---
Pay Restoration	618	---	---	-618	---	---
Total, Buildings and Community Systems	$38,955	$ ---	$ ---	$ ---	$-1,675	$37,280
Operating Expenses ...	$37,008	$ ---	$ ---	$ ---	$-1,591	$35,417
Capital Equipment	1,947	---	---	---	-84	1,863

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF CHANGES
ENERGY CONSERVATION
BUILDINGS AND COMMUNITY SYSTEMS
(In thousands of dollars)

FY 1986 Conference mark less G-R-H adjustment.....	$37,280
Built in increases and decreases:	
None	0
FY 1986 Adjusted and FY 1987 base	$37,280
Program increases and decreases:	
Buildings Systems	
o Building materials research	-1,024
o Building subsystems research	
-Walls research	- 476
-Fenestration research	-1,489
-Lighting requirements research	- 186
-Indoor air quality, infiltration and ventilation.....	+ 132
o Building systems integration research	
-Commercial building systems interactions	- 930
-Residential building systems interactions	- 838
-Performance calculations	- 744
-Building energy control systems	- 93
o Building energy retrofit research	
-Single family retrofit research	- 736
-Multifamily retrofit research	- 702
-Commercial building retrofit research	- 796
o Energy conservation standards and guidelines	- 717
Subtotal	$-8,599
Community Systems	
o District heating and cooling	
-Systems and components research	-1,020
-Feasibility studies	- 657
o Community energy systems integration	
-Urban Consortium	-1,864
-Site design	- 186
Subtotal	$-3,727

Technology and Consumer Products

o Thermally activated heat pumps	- 364
o Advanced refrigeration systems	-2,131
o Combustion systems research	- 655
o Lighting equipment research	- 962
o Equipment integration research	- 941
Subtotal	$-5,053

Analysis and Technology Transfer

o Technical assessment and analysis	- 50
o Utility applications research	- 951
o Rural Housing Amendments Act study	- 308
o Research utilization	- 450
o Technology transfer	+ 200
Subtotal	$-1,559

Appliance Standards

o Test procedures development and consumer education	- 790
o Appliance standards development	+ 127
Subtotal	$- 663

Federal Energy Management Program

o Federal planning, reporting and evaluation	+ 100
o Technical guidance and assistance to Federal agencies	- 237
Subtotal	$- 137

Residential Conservation Service

o Commercial and Apartment Conservation Service	- 372
Subtotal	$- 372

Program Direction

o Price out of staffing	-1,157
Subtotal	$-1,157

Capital Equipment

o Laboratory and field test equipment	-1,863
Subtotal	$-1,863
FY 1987 budget request	$14,150

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
NARRATIVE JUSTIFICATION
ENERGY CONSERVATION
BUILDINGS AND COMMUNITY SYSTEMS

The goal of the Buildings and Community Systems (BCS) program is to advance technologies that will increase the energy efficiency of the built environment. This goal is being achieved through a comprehensive research program, transfer of the results of this research to the private sector, and implementation of DOE's statutory responsibilities in the buildings area.

Accomplishments for FY 1985 and anticipated accomplishments for FY 1986 include:

- Developed and promulgated interim standards for new commercial buildings and new Federal residential buildings (including manufactured housing).
- Initiated a collaborative effort to predict, measure and control radon concentrations in homes in coordination with an epidemiological study by DOE's Office of Health and Environmental Research.
- Completed a systems integration study of multifamily midrise and highrise buildings and published a handbook of research findings as a guide to energy-conserving designs.
- Completed guidelines for energy efficient site-built single family residences and produced manuals and slide rules for designers and builders.
- Validated a laboratory method for measuring the static thermal performance of large, complex wall sections. Developed an improved method for testing and predicting the performance of complex fenestration designs.
- Completed a detailed assessment of technical issues concerning ureaformaldehyde foam insulation.
- Developed scope of work, organized the research, and identified methods to renovate old steam district heating systems using the Scranton, Pennsylvania, system as a laboratory. Completed drilling, water characteristics analysis, and tests of heat exchangers for a mine-water heat recovery project.
- For district heating and cooling systems initiated research aimed at enhancing the energy delivery capacity of fluids using drag reduction additives (slippery water) and phase change material (liquid ice) for increased cooling capacity.
- In cooperation with the communities involved, completed assessment of the applicability of district heating and cooling in 15 additional communities.

- Supported the Urban Consortium Energy Task Force in conducting 20 local government conservation energy projects and 4 regional workshops to share the results of successful projects with other local communities.

- Through seven workshops conducted by the U.S. Conference of Mayors, disseminated information and technology about district heating and cooling to city officials, planners, developers and engineers to assist them in applying district heating and cooling systems to their communities.

- Completed design and laboratory validation of two important heat pump developments: a prototype optimized ground-coupled heat pump mechanical package, and a breadboard advanced cycle absorption heat pump for residential use which verified the performance potential of the selected cycle.

- Completed evaluation of alternate cycle concepts using non-azeotropic refrigerant mixtures and initiated laboratory experiments to develop refrigerant separation techniques for composition control.

- Completed characterization of corrosion and physical-chemical behavior of selected stainless steels as part of the effort to solve the corrosion problem in condensing heat exchangers.

- Improved the efficiency of fluorescent lamps by nearly 35 percent by combining the effect of both isotope enrichment and magnetic enhancement.

- Issued final rules amending test procedures for water heaters to include heat pump water heaters, and amending the procedures for central air conditioners to reduce testing burden and increase accuracy.

- Established a Building Energy Accounting System (BEAS) to provide readily available, computerized historic data and projections on the characteristics, energy consumption, and energy conservation of buildings, and to publish an annual Building Energy Data Book.

- Developed and implemented a program that in cooperation with the utility industry will make available needed analytical tools and data that can be used to determine the impact of energy conservation on utility long-term demand-side planning.

- Conducted research that led to the incorporation of more effective equipment retrofit measures in existing low-income weatherization programs; determined that such measures can substantially increase the energy savings realized.

- Initiated cooperative research with the Department of Housing and Urban Development directed at conserving energy in existing, Federally assisted housing.

- o Developed standard protocols for coordinating retrofit research in residential buildings and participated in cost-shared research directed at measuring the effectiveness of single-family retrofit activities.

- o Identified technical and behavioral problems that may be reducing the effectiveness of building retrofit measures.

Accomplishments in the area of Residential Conservation Service:

Over a million Residential Commercial Service audits were provided in FY 1985, bringing the total to more than 4 million since program inception. Commercial and Apartment Conservation Service program implementation has continued. About half the States now have approved plans for Commercial and Apartment Conservation Service program implementation.

Studies have been initiated to identify promising program alternatives and means of assisting States, utilities, or community level organizations in implementing energy conservation programs. These studies also support the evolution of the Federal role from a regulatory basis to encouraging voluntary participation. The studies suggest that a flexible and multifaceted approach, facilitated by Federally-sponsored technical and information resources, is needed to assist States, utilities, and others in the operation of conservation and demand-side management programs to increase energy efficiency in residences and small-to medium-sized commercial buildings. Examples include:

- Qualitative Analysis of alternative audits, financing, direct installation and marketing programs offered by utilities in California, Florida, Michigan, Nebraska, Oklahoma and Texas.

- Evaluation of Florida Power and Light (FPL) "HELP" program, which includes a simplified audit and subsidized installation of low-cost measures, to assess auditor marketing skills, extent of customer action on HELP recommendations, and relationship to other FPL residential programs.

- Evaluation of General Public Utilities (GPU) "RECAP" program, which offers selected Pennsylvania and New Jersey residents retrofits financed through shared savings. Analysis focuses on contracting arrangements, marketing, energy savings, behaviorial and comfort changes, and shifts in electrical load shape.

- Analysis of key operational and management factors in the "Weatherize Portland" (ME) program to identify those factors contributing to the success of this comprehensive multi-partner program which incorporates the RCS audit within a full-service program.

- An update of the evaluation of the RCS program to provide current information on overall program results, the effects of rebates, low-interest loans, direct installation, and other corollary utility programs on RCS participation, and a survey of States' and utilities' plans to continue with RCS or implement follow-on programs.

As electric utilities place more emphasis on demand-side activities, and other State and local program implementers seek solutions to energy problems, there is an interest in and need for a wide range of information and technology transfer. DOE has assisted in meeting this need through a variety of activities. For example:

- DOE, the Electric Power Research Institute and the Alliance to Save Energy co-sponsored the Second National Energy Efficiency Conference. This was held in conjunction with an energy exposition held in San Francisco, California and sponsored by the Pacific Gas and Electric Company in May 1985. Over 700 utility professionals, government officials and corporate energy managers attended. Topical sessions covered new strategies for program design, evaluation, technical developments, policy issues and marketing. Plenary sessions also provided a variety of national perspectives by representatives from energy industries, universities, Congress and the Executive Branch.

- In September 1985, DOE sponsored the "Conference on Commercial and Apartment Conservation Programs" in Minneapolis, Minnesota. Representatives from State energy offices, utilities, local housing authorities and energy service companies attended. The majority of the sessions addressed some aspect of marketing: identification, segmentation, approaches, or other issues and techniques. Other sessions presented commercial/multifamily research results and actual program experience.

Departmental Request

Funding requested for the Buildings and Community Systems program in FY 1987 is $14,150,000. The reduction of $23,130,000 compared to the FY 1986 appropriation results from the discontinuation of funding for capital equipment and one subprogram, the transfer of a second subprogram, and the discontinuation of a number of activities in the remaining subprograms. The Community Systems subprogram is being discontinued after funding district heating and cooling feasibility studies in more than 50 communities, showing the potential of this technology, and encouraging other communities to undertake such studies on their own. The Residential Conservation Service subprogram has been transferred to the Office of State and Local programs and is discussed in that section of the budget request.

Funding is requested in FY 1987 for Program Direction and for activities in the following subprograms:

- o Building Systems
- o Technology and Consumer Products
- o Appliance Standards
- o Analysis and Technology Transfer
- o Federal Energy Management Program

Building Systems.....$3,500,000

The objective of the Building Systems subprogram is to encourage optimal use of energy in U.S. buildings. Long-term generic research is conducted to advance the knowledge of energy transfer phenomena in buildings and the results of that research are provided to practitioners in the building industry. The FY 1987 budget request for this subprogram is $3,500,000. This represents a reduction of $8,599,000 compared to the FY 1986 appropriation. This funding level will allow research and development in the Building Subsystems and Standards and Guidelines activities to be continued.

The Building Subsystems research activity addresses the energy-related characteristics of the several elements and components that, when assembled, constitute a building system. A significant portion of the research is directed toward determining analytical relationships among physical properties of individual subsystems and the flow of energy and mass (e.g., moisture and air) through the subsystems. These analytical relationships then form the bases for models used to predict the energy performance characteristics of subsystems. Laboratory and field testing programs are conducted to validate these models and to establish data bases to be used by practitioners in the building community. Research in this activity is also directed toward providing a supporting technical basis for the development of guidelines and voluntary standards for use in designing more energy efficient building elements. In FY 1987 efforts in this key activity will include research in walls; roofs; and indoor air quality, infiltration, and ventilation.

Walls research is conducted to determine those characteristics of walls that influence the conservation effectiveness of buildings. The research is divided into thermal testing of walls; evaluation of thermal wall anomalies; an evaluation of mass influence on energy utilization; and the study of foundation design and earth contact. Research in FY 1986 includes the development of dynamic thermal testing protocols; analysis of thermal mass modeling and prediction techniques; measurement, modeling, and evaluation of thermal bridges, breaks, convective loops and other thermal anomalies; and the planning for future foundation and earth contact research. Research in FY 1987 will emphasize studies of innovative wood, lightweight concrete and other foundation insulating techniques. Moisture effects on overall energy performance of walls and foundations will be evaluated and development of analytical models for predicting foundation thermal performance will be initiated. Dynamic testing of innovative wall constructions will be initiated, and the effect of thermal mass in multifamily residential structures will be evaluated.

In FY 1986, roof research focuses on improving energy efficiency and durability characteristics of roof systems. Research areas include developing an integrated mathematical model to predict thermal performance of composite roofs, thermal performance testing of high and low efficiency roofs under field conditions, and developing diagnostic probes for quantitative moisture measurements in roof systems. In FY 1986, a roof model is being developed to simulate thermal and moisture transport behavior of roofs. In FY 1987, this model will be expanded to include effects of mechanical and structural stress. In FY 1986, development of non-destructive and intrusive moisture measuring instruments using electrical capacitance and resistance is continuing. These instruments will be completed and calibrated in FY 1987. In FY 1986, studies of the effects of solar absorptance and ultraviolet radiation on thermal performance will be completed. In FY 1987, effects of thermal bridging and wet insulation on thermal performance will be evaluated. An industry advisory panel is assisting in developing roof research plans.

Indoor air quality, infiltration, and ventilation research in FY 1986 includes collection of infiltration and ventilation measurements in large buildings. Collaborative interagency efforts to study the generation and distribution of biological aerosols is continuing. Development and evaluation of infiltration, ventilation, and air leakage measurement systems for multifamily buildings is being completed. Development of a simplified multizonal infiltration and ventilation model is continuing and a study of occupant behavior effects on infiltration and ventilation performance is being initiated. Assessment of ambient indoor radon levels, characterization of radon building entry mechanisms, and field studies on radon control and mitigation are continuing. Research to develop, test, and evaluate energy efficient and cost-effective strategies to maintain indoor air quality is continuing, and interagency efforts to model indoor air quality are being initiated. Collaborative efforts to develop voluntary consensus standards for indoor air quality, and interagency coordination of indoor air quality research are continuing. In FY 1987, research will continue and the newly initiated FY 1986 efforts will be expanded in all the areas described above except the study of occupant behavior effects on infiltration and ventilation performance. That study will be discontinued.

The Standards and Guidelines activity is a Congressionally mandated, multiyear effort to develop energy conservation standards and guidelines for new commercial and residential buildings (including manufactured housing). The Energy Conservation Standards for New Buildings Act, as amended, requires that DOE develop and promulgate interim standards and then final standards for each classification. The standards are mandatory for Federal agencies only. They are to serve as voluntary guidelines for the non-Federal sector. The Act also requires DOE to conduct demonstration projects for each standards activity and report the results to the Congress. FY 1987 funding will be used to complete development and prepare the Notice of Proposed Rulemaking for the interim voluntary residential and manufactured housing standards.

Technology and Consumer Products.....$5,000,000

The purpose of the Technology and Consumer Products subprogram is to provide the technological basis for improved, energy efficient building energy conversion processes and equipment. Research is conducted to investigate, develop, and test generic technical approaches and engineering concepts with potential for substantially increasing the efficiency with which raw energy in the form of oil, gas, solid fuels and electricity is converted into useful energy in the form of heat, refrigeration, and lighting.

The FY 1987 budget request for Technology and Consumer Products is $5,000,000. This represents a reduction of $5,053,000 compared to the FY 1986 appropriation. This reduction is achieved by discontinuing research in the technologies supporting combustion systems and advanced refrigeration systems, and by curtailing research in lighting equipment technologies. The greatest promise for significant energy savings in the Technology and Consumer Products subprogram is in the areas of thermally activated heat pumps and advanced lighting equipment. Therefore, funding is requested for continued research in these areas.

Thermally Activated Heat Pumps: This activity consists of research on engine driven and absorption heat pump systems. During FY 1986, proof-of-concept testing on novel advanced cycle absorption heat pumps using conventional fluids and ternary mixtures, research on free piston Stirling (FPS) and internal combustion (IC) engine driven heat pumps component fabrication, and supporting research on FPS engine/compressor dynamic interaction and model development continued. In FY 1987, proof-of-concept testing of novel advanced cycle absorption heat pumps, research on novel sealing concepts for engine driven systems, field evaluation of a commercial IC engine heat pump, and evaluation of low loss hydraulic compressor Stirling engine driven heat pumps will continue. Successful research in this area has the potential of saving about 4.0 quads of energy annually.

Lighting Equipment Research: This activity consists of research on light sources and the optimized integration of lighting system components into the total building. During FY 1986, research was focused on characterizing lamp discharge efficiency improvements through experimental, diagnostic investigation of low and high pressure discharge phenomena. In FY 1987, research will continue to investigate this improvement in efficiency of magnetically loaded lamps and electrodeless, surface wave (gigahertz) lamp discharges. Initial work will concentrate on lamp driving concepts and

prototype development of a scaled down electrodeless high intensity discharge lamp with novel gas radiator fills. Non-intrusive diagnostic techniques for characterizing lamp discharges will be developed and applied, and lighting system components for advanced designs will be characterized for designed building spaces. No funding is requested for studies of efficiency improvement through mercury isotope enrichment or for development of mercury isotope separation processes since the comparative evaluation of separation techniques will be completed with FY 1986 funding. Successful lighting equipment research has the potential of saving 1.5 quads of energy.

Analysis and Technology Transfer.....$1,000,000

The purpose of the Analysis and Technology Transfer subprogram is to ensure that research results and information on conservation in buildings are transferred to the private sector, and to conduct the necessary analysis to support program planning. The FY 1987 budget request for this subprogram is $1,000,000, a reduction of $1,559,000 compared to the FY 1986 appropriation. This funding will support centralized technology transfer activities and continuation, at a reduced level, of the analysis activities. It includes continued support for U.S. participation in International Energy Agency (IEA) agreements, technology assessments, and policy and program analysis.

The requested funding is necessary to ensure that U.S. citizens benefit fully from BCS programs. The analysis activity ensures that the most beneficial building energy conservation research projects are conducted and that they are conducted to most effectively complement private sector activities. The technology transfer activity not only ensures that technical knowledge is quickly, effectively, and efficiently disseminated, but that knowledge about what building conservation programs work for utilities, local governments and the private sector is made easily accessible. In FY 1987, technology transfer will provide a capability to monitor research progress to ensure early, effective transfer of the results, publish state of the art and cross-cutting (i.e., integrating results across programs) reports, and coordinate with private sector associations and other organizations.

No FY 1987 funding is requested for utility applications research which is being discontinued, or for the Rural Housing Amendments Act Study since it is being completed with FY 1986 funds.

Appliance Standards.....$1,200,000

The FY 1987 budget request for Appliance Standards is $1,200,000. This represents a reduction of $663,000 compared to the FY 1986 appropriation. This reduction is achieved by discontinuing research in appliance test procedures. Appliance standards development is maintained at approximately the same level as in FY 1986.

The purpose of the Appliance Standards activity is to conduct the analysis and regulatory activities necessary to comply with the Energy Policy and Conservation Act (EPCA), as amended. In 1987, the Department will conduct research and analysis on the impacts of appliance standards including a reevaluation of those previously issued. This reevaluation is required by a recent U.S. Court of Appeals decision and by section 325(h) of EPCA which

specifies that it be completed by FY 1988. The analysis will consider the energy performance and cost of advanced prototype models of the covered appliances as well as foreign models; the economic justifiability of standards, including their impact on manufacturers; and the energy savings that result from any standards regulation.

Federal Energy Management Program.....$1,050,000

The Federal Energy Management Program (FEMP) is a Federally directed effort to reduce energy use by Federal agencies, improve utilization efficiency, conserve scarce fuel, and transfer energy management experience among Federal agencies, IEA member nations, State and local governments, and the private sector. The FY 1987 budget request for FEMP is $1,050,000. This is a reduction of $137,000 compared to the FY 1986 appropriation. It will be achieved by reducing the technical guidance and assistance provided to other Federal agencies. Evaluation of shared savings contracting will be increased.

The requested FY 1987 funding is necessary to continue the implementation of Federal laws and Executive Orders pertaining to energy conservation in the Federal government; prepare annual reports to the President and Congress; monitor Federal agency conservation activities and performance; assist agencies in developing and implementing energy conservation programs; and provide them with technical guidance (i.e., "How to" manuals, workshops on "Life Cycle Cost" analyses and "Energy in Design," courses on shared-savings contracting, and employee awareness programs). Training materials and workshops for Federal architects and engineers to acquaint them with the recently issued mandatory standards for existing buildings will be continued and will be opened to private architectural and engineering firms. Support will be provided to Federal agencies to demonstrate the new interim standards as required by the Energy Conservation Standards for New Buildings Act. A mechanism for exchanging experiences and information among IEA member nations on effective retrofit measures in public buildings will be developed.

RESIDENTIAL CONSERVATION SERVICE	FY 1985	FY 1986	FY 1987 Congessional Request
	$1,274,000	$ 372,000	-0-

The FY 1987 budget request provides no funding for Residential and Commercial Conservation (RCC) which includes the Residential Conservation Service (RCS) and the Commercial and Apartment Conservation Service (CACS). This funding level represents a $372,000 decrease from FY 1986.

In FY 1986, implementation of CACS will continue, and the CACS Federal standby programwill be initiated. The funds will be used to support technical review of CACS state plan amendments and CACS Federal standby procedures proposed by utilities in Federal standby states, to provide limited technical assistance to those states and utilities and to monitor and evaluate the CACS and CACS standby programs.

There will be little DOE activity in FY 1986 related to RCS. The requirement that utilities disseminate RCS program announcements terminated January 1, 1985, and it is assumed that many utilities phased down their RCS programs over the course of 1985. An updated evaluation report will be issued and results shared with States, utilities, and other interested parties. Monitoring of utility supply installations and financing activities will continue.

Consistent with the shift away from a Federal regulatory role, activities were initiated in FY 1985 to encourage voluntary utility energy efficiency programs which are more cost effective than RCS and better suited to utility needs. These activities will continue in FY 1986 on a limited basis.

In FY 1987 Federal support for RCS and CACS will be terminated. Limited staff assistance will be provided to utilities and related groups to encourage voluntary energy efficiency programs using non-Federal funds.

Program Direction.....$2,400,000

The FY 1987 budget request for Program Direction is $2,400,000. This represents a reduction of $1,157,000 compared to the FY 1986 appropriation. The requested funding will provide salaries, benefits and travel for a staff of 45 FTE's to manage the Buildings and Community Systems program.

DEPARTMENT OF ENERGY

FY 1987 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE
ENERGY CONSERVATION
INDUSTRIAL ENERGY CONSERVATION

(Tabular dollars in thousands. Narrative material in whole dollars.)

Departmental Request	FY 1985 Approp.	FY 1986 Approp.	FY 1987 Base	FY 1987 Request	Request vs. Base
Waste Energy Reduction					
Operating Expenses	$11,859	$11,174	$11,174	$ 6,300	-$ 4,874
Capital Equipment	-0-	-0-	-0-	-0-	-0-
Subtotal	$11,859	$11,174	$11,174	$ 6,300	-$ 4,874
Industrial Process Efficiency					
Operating Expenses	$ 9,556	$19,551	$19,551	$ 5,479	-$14,072
Capital Equipment	1,156	-0-	-0-	-0-	-0-
Subtotal	$10,712	$19,551	$19,551	$ 5,479	-$14,072
Industrial Cogeneration					
Operating Expenses	$ 4,116	$ 4,377	$ 4,377	$ 1,500	-$ 2,877
Capital Equipment	1,000	-0-	-0-	-0-	-0-
Subtotal	$ 5,116	$ 4,377	$ 4,377	$ 1,500	-$ 2,877
Implementation & Deployment					
Operating Expenses	$ 2,212	$ 2,978	$ 2,978	$ 500	-$ 2,478
Capital Equipment	-0-	-0-	-0-	-0-	-0-
Subtotal	$ 2,212	$ 2,978	$ 2,978	$ 500	-$ 2,478
Program Direction					
Operating Expenses	$ 1,807	$ 2,016	$ 2,016	$ 1,844	-$ 172
Subtotal	$ 1,807	$ 2,016	$ 2,016	$ 1,844	-$ 172
Total					
Operating Expenses	$29,550	$40,096	$40,096	$15,623	-$24,473
Capital Equipment	2,156	-0-	-0-	-0-	-0-
Total - Industrial Energy Conservation	$31,706	$40,096	$40,096	$15,623	-$24,473
Staffing Total FTE's	33	35	35	26	-9

AUTHORIZATION: P.L. 93-572, "Federal Non-Nuclear Energy Research and Development Act of 1974"
P.L. 95-619, "National Energy Conservation Policy Act"
P.L. 94-163, "Energy Policy and Conservation Act"
P.L. 93-438, "Energy Reorganization Act"
P.L. 95-91, "Department of Energy Reorganization Act"

Department of Energy

FY 1987 Congressional Budget Request

Adjustments to FY 1986 Appropriations

	FY 1986 Conference	General Reduction	Management Initiatives	Pay Cost Restoration	Gramm-Rudman Hollings Reduction	Adj. Approp. Total
Industrial Energy Conservation						
Waste Energy Reduction	$ 12,006	$ -72	$ -258	$ ---	$ -502	$11,174
Industrial Process Effic.	21,000	-119	-452	---	-878	19,551
Industrial Cogeneration	4,700	-25	-101	---	-197	4,377
Implementation & Deployment	3,200	-19	-69	---	-134	2,978
Program Direction	1,927	-12	-47	238	-90	2,016
Subtotal, Industrial Energy Conservation	42,833	-247	$ -927	$ 238	$-1,801	$40,096
General Reduction: Operating Expenses.....	-247	+247	---	---	---	---
Management Initiatives: Operating Expenses.....	-927	---	+927	---	---	---
Pay Restoration	+238	---	---	-238	---	---
Total, Industrial Energy Conservation	$41,897	$ ---	$ ---	$ ---	$-1,801	$40,096
Operating Expenses	41,897	---	---	---	-1,801	40,096

DEPARTMENT OF ENERGY

FY 1987 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF CHANGES
INDUSTRIAL ENERGY CONSERVATION
(In Thousands of Dollars)

President's FY 1986 Appropriation	$40,096
Waste Energy Reduction	
- Decreased Effort on Improved Combustion Efficiency	- 259
- Reduced High Temperature Recuperators R&D	- 1,730
- Reduced Industrial Heat Pumps R&D	- 1,298
- Increased Effort on CO_2 Utilization	+ 345
- Decreased Effort on Waste Utilization	- 778
- Decreased Program Support	- 1,154
Industrial Process Efficiency	
- Decreased Thin Strip Casting Research	-12,486
- Decreased Electrode Materials R&D	- 933
- Decreased Coatings Research	- 187
- Decreased Sensors & Controls R&D	- 466
Industrial Cogeneration	
- Decreased Effort for Externally Fired Brayton	- 2,175
- Decreased Effort on Direct Conversion R&D	- 362
- Decreased Effort on Bottoming Cycles Conversion	- 182
- Decreased Activity on Coal-Slurry Diesel	- 158
Implementation and Deployment	
- Decreased Funds for Technology Transfer	- 814
- Decreased Funds for Energy Audit & Diagnostic Centers	- 1,386
- Decreased Funds for Industrial Reporting	- 278
Program Direction	- 172
FY 1987 Departmental Request	$15,623

Program Objectives and Strategy:

The goal of the industrial energy conservation program seeks to increase energy use efficiency and improve industry's ability to utilize the most cost-effective fuels, via a program of carefully targeted technology research and development activities. The program is focused on high risk development which is in the national interest and for which private industry has insufficient incentive to pursue independently. Most of the activities are conducted by private institutions operating under cost-shared contracts or cooperative agreements with the Department. The industrial energy conservation program is aimed at providing: cost-effective technology options that are available to industry for reducing energy losses embodied in waste streams, waste materials and inefficient processes; technologies which can provide greater fuel flexibility; and the transfer of the technical information to industry for the rapid deployment of the new technologies.

Examples of research and development activities being pursued include:

- Large scale industrial heat pumps that can economically upgrade waste heat to useful process steam.
- High temperature recuperators that can operate in dirty and corrosive waste streams at temperatures up to 2600°F.
- Development of coal-fired equipment that can be retrofitted into existing gas and oil-fired industrial furnaces and boilers.
- Research and development of cost-effective technologies which will make the conversion and/or retrieval of materials from waste streams practical and attractive to industry.
- Advanced sensors and control systems to enable more precise control of energy-intensive processes.
- Electrode materials development to improve operating efficiency of electrolytic cells.
- Direct casting of thin steel strip to eliminate energy-intensive reheating and rolling operations.
- Research and development of separation systems, including membranes, to economically and efficiently replace energy inefficient separation processes.
- Effective means of communicating with the industry sector for the rapid transfer of technology research and development.

Accomplishments for FY 1985 and Anticipated Accomplishments for FY 1986:

- Testing of an Air-Fuel ratio control device developed by DOE on a Potomac Electric utility boiler was completed. Funding for the test was provided by EPRI.
- Three high temperature prototype heat exchangers were installed at industrial sites and proof-of-concept testing was started.
- A study on the circulating fluid bed concept for the externally- fired Brayton cogeneration system was completed.
- A series of test runs were completed on a slow speed diesel test engine using three different coal/water slurries. Some runs were continued for a period of 7-8 hours duration.
- Field testing of two sensors started at paper mills for improved on-line control of processes.
- Completed testing of a new gasification process for paper mill black liquor which makes it safer to recover pulping chemicals and improves the overall recovery of energy from the black liquor processing.
- A project to more efficiently remove water during the paper making process was completed and a technology transfer conference on the results was held with industry representatives.
- Two contracts were commenced to develop the technology for thin strip casting of steel.
- Field testing will be completed on two high temperature prototype heat exchangers.
- A Brayton solvent recovery system prototype will complete its testing at an industrial site.

- o A plating chemicals recovery system will complete its long term testing at an industrial site.
- o Large scale testing for the recovery of CO_2 from large boiler exhaust stacks will be started.
- o Two large scale prototype slagging combustors will complete testing to show the feasibility of retrofitting industrial oil and gas fired boilers for coal fuel use.
- o Topping combustor tests will be completed to show feasibility of use for the externally coal-fired Brayton cogeneration system.
- o Proof-of-concept testing of a BiPhase turbine unit will be started for separation of oil and gas at an oil processing station.
- o Testing of two sensors at paper mills will be completed.
- o Laboratory testing of a 120 watt prototype sodium heat engine will be completed.
- o The seven Energy Integrated Farm projects will be completed and operational information will be available in final reports.
- o Complete installation of the horizontal caster for thin strip casting at the U.S. Steel research facility.

Budget Request

The Office of Industrial Programs' FY 1987 Congressional Budget Request is $15,623,000 which is $21,173,000 less than the FY 1986 Appropriation.

Five subprograms of the industrial energy conservation program encompassing specific objectives and strategies to meet the overall industrial program objectives are:

- o Waste Energy Reduction
- o Industrial Process Efficiency
- o Industrial Cogeneration
- o Implementation and Deployment
- o Program Direction

In the following sections each of these subprograms is discussed in detail including the activities carried out with the requested budget level. Although this is the current plan for the activities within the subprograms there could be variations from project-to-project based on the findings of subsequent research stages.

	FY 1985	FY 1986	FY 1987 Request
Waste Energy Reduction:	$11,859,000	$11,174,000	$ 6,300,000

The FY 1987 Congressional Budget Request is $6,300,000. This is $4,874,000 less than the FY 1986 Appropriation. The goal of Waste Energy Reduction is to conduct research and to develop energy efficient technologies to recover energy contained in industrial waste streams and waste materials, and to more efficiently utilize the energy content of fuels. The research is addressed within three district areas: waste heat recovery, combustion efficiency, and industrial waste utilization. National laboratory management support and analysis for all of the industrial energy conservation program is included in this subprogram and support services.

The Waste Energy Reduction activities for FY 1987 have generally been reduced from the prior fiscal year request, in order to focus the work on longer-term, higher-risk areas of research. The economic self-interest of firms provides a strong incentive for the adoption of waste energy reduction concepts as soon as they are shown to be viable. The joint coal burner development with Fossil Energy will be concluded in FY 1986 and no additional effort will be undertaken in FY 1987. Efforts in the recuperator and heat pump programs have been realigned in FY 1987 to minimize any hardware development and to concentrate on materials development and laboratory studies of systems and application potential. Waste utilization project activity has been reduced to concentrate in fewer but high potential energy reclamation areas of liquid and solid wastes. The project for the generation and recovery of CO_2 from large coal-fired boilers has been increased in funding to complete a larger scale test of the technology to observe effects of larger scale operation on boiler performance. Program support functions at INEL, PNL, ANL &

ORNL for project monitoring and proposal evaluation, as well as analytical support by selected contractors, has been reduced.

Combustion Efficiency: Combustion efficiencies range up to about 80 percent depending on process and system design and there is a need for technology which enhances the fuel flexibility of industrial systems and for more efficient combustion and heat transfer within the furnaces, boilers, and process heaters. The improved combustion efficiency program concentrates on these technology development areas.

The development of technology for using oxygen enriched combustion air will increase the overall efficiency of the combustion process through increased flame temperature, decreased excess air, decreased nitrogen pass-through, and higher combustion air preheat.

Oxygen enrichment activities in FY 1986 will be continued with the laboratory study and testing of combustors using enriched combustion air. In addition FY 1986 funds will be used to continue research on combustion controls for high temperature oxygen enriched combustion air to meet the faster response required by the high temperatures. In FY 1987 these activities will be continued, including improvements in heat transfer and fouling/corrosion control techniques.

The advanced slagging and non-slagging coal combustor development activity funded jointly with Fossil Energy will be concluded in FY 1986.

Waste Heat Recovery: This activity area is intended to establish a strong technology base to address current deficiencies which prohibit timely development of ceramic heat recuperators and heat pump technology for a wide range of industrial waste heat sources. Current heat recuperator technology cannot be effectively applied without severe degradation in performance or high cost penalties to an estimated 2 quads of thermal energy wasted with corrosive and potentially fouling high temperature exhaust systems. High temperature waste stream data is needed to solve problems and limitations of present heat exchanger technology. Similarly, development of new heat pump technology is needed to allow upgrading of an estimated 3.5 quads of process liquid and gas waste heat to a more useful process temperature level.

High temperature ceramic materials development will be continued in FY 1986 and FY 1987. The low cost silicon powder development will be completed in FY 1986 and the results will be disseminated to industry. In FY 1987, funds will be used to develop a gel casting technique, research on composite ceramics, and use of woven shapes coated with chemical vapor deposited materials. In FY 1986 work will continue on non-destructive test methods and service life prediction methods for ceramic heat exchanger components which operate in severe environments. This work will be completed in FY 1987 and sample flawed materials will be tested in the laboratory under various thermal environments to develop lifetime prediction techniques.

In FY 1986 concepts for various heat pump systems (chemical, magnetic, Rankine) will be evaluated and design studies initiated. Alternative working fluids for the systems will be included in the evaluation. Predictions of expected performance will be made. In addition the utilization of a new analysis technique, "pinch network analysis", will be explored for determining where heat pumps can be integrated into manufacturing processes. This design and analysis work will be continued with FY 1987 funds based on the network analysis work. A laboratory breadboard model of a heat of reaction concept heat pump will be built and tested to verify analytical predictions.

Industrial Waste Utilization: A variety of solid and fluid waste materials presenting serious environmental problems for industry could be economically recycled or converted into useful fuels or energy-intensive products, if suitable specialized technology existed. Innovative mechanical, biochemical and thermo-chemical processes for converting solid and liquid wastes into fuels and feedstocks, and for recovering and recycling organics, inorganics, fibers, used oils, and metals, are needed to foster the development of substantial new private industrial activity in this area.

In FY 1986 and FY 1987 biological waste conversion will be continued on various industrial wastewater streams and in FY 1987 paper mill liquid wastes will be treated using enhanced biological strains to improve the production of methane. The use of

membranes for separation of high oil or organic content waste streams will be explored and the economics of separation will be evaluated. Various activities concerned with solid wastes will be continued in FY 1986 and FY 1987. Specifically, utilization of asphalt roofing wastes, discarded tires, auto shredder wastes, and textile wastes for use as fuels will be continued. Textile waste fibers are also being considered as a strengthener and filler for some injection molded plastic parts.

Laboratory investigation of waste CO_2 recovery from stack gases will continue in FY 1986 with a scale up of combustion testing in a 6 million Btu/Hr furnace. This work will be continued in FY 1987 to determine scale-up effects including cold wall radiant effects and deposits on boiler tubes. Industry appears very interested in this concept and if the 6 million Btu/Hr tests are successful, work will proceed on transferring the technology to them for a pilot scale test.

The laboratory test work on producing diesel fuel from cellulosic materials was completed in FY 1985 and a technical paper on the results was presented at the Biomass Energy Regional Association Conference. In FY 1986 work was continued on the drying of in-forest wood residues. A site test will be conducted to complete the activity.

Laboratory and Analytical Support: National laboratories provide significant support to Headquarters staff in managing the activities of the total industrial program and to perform technical analyses as required. The Idaho National Engineering Laboratory, Argonne National Laboratory, Pacific Northwest Laboratory and the Oak Ridge National Laboratory are the principal participants in providing this support. Most of the management support is performed by Idaho National Laboratory which, through the Idaho Operations Office, evaluates proposals, monitors about 70 projects, prepares RFP's and conducts special studies as required. In addition analytical support is provided directly to Headquarters staff by selected contractors.

	FY 1985	FY 1986	FY 1987 Request
Industrial Cogeneration:	$ 5,116,000	$ 4,377,000	$ 1,500,000

The FY 1987 Congressional Budget Request is $1,500,000. This is $2,877,000 less than the FY 1986 Appropriation. The goal of Industrial Cogeneration is to encourage research on improved energy conversion systems to meet various industrial cogeneration requirements including systems with high electrical to thermal output ratios; advanced low voltage; high current direct conversion devices; characterization of organic Rankine cycle working fluids; and bottoming cycles development and evaluation.

The Industrial Cogeneration activities have been reduced from the FY 1986 planned activities. Work on the externally-fired Brayton system will be concluded at the end of FY 1986. The steam diesel development will continue but at a lower level of funding. Direct conversion work on thermionics will be concluded in FY 1987 although the sodium heat engine work will continue. Bottoming cycle research will be phased out in FY 1986 and not continued in FY 1987.

Advanced Topping Cycle Systems: Increased use of industrial cogeneration can be fostered through development of higher electrical-to-thermal output ratio systems than are yielded by standard steam turbine concepts. In addition development of technologies which utilize coal as a fuel permit flexibility of fuel choice. The development of innovative cogeneration systems will aid in meeting a projected growth for cogeneration of over 80,000 MW by the year 2000.

In FY 1986 the coal combustor topping tests were completed for the externally coal-fired Brayton system. Tests will also be conducted for waste fuels. A design study for a low temperature ($1600^{0}F$) turbine will be started and an economic analysis made to compare the system with/without a topping combustor.

Activities on the coal-water fired "steam diesel" will be continued in FY 1986 and FY 1987. A parametric design of a full scale engineering test facility diesel engine will be completed in FY 1986 which would be used for long term testing of coal/water slurry

fuels. In addition, installation design of a generic coal-water fired diesel will be accomplished in FY 1986 and an industry interaction group will be formed to review the test results and share in test engine planning. In FY 1987 the steam diesel study and laboratory testing of a laboratory scale steam diesel will be continued to determine engine wear rates. Additionally, laboratory tests will be conducted on coal slurry rheology to overcome limitations in pumping high coal ratio slurries to the engine.

Conversion of Thermal Energy to D.C. Electricity: Direct conversion devices, such as the thermionic diode and the sodium heat engine, may be able to cost-effectively meet some of industry's 5,000 megawatt requirement for relatively low voltage d.c. power used in electrolytic cells and other processes.

As a result of the laboratory work conducted in FY 1985 including an evaluation of the thermionic diode economics, the planned activity for FY 1986 will concentrate on the development of a larger size, more efficient diode. The larger units will be designed and laboratory prototypes built for testing in FY 1986. In addition, new approaches, including new materials and modes of operation, will be explored for improved output.

A 1,000 watt laboratory sodium heat engine will be designed and built with FY 1986 funds and laboratory tested in FY 1987. Performance of the unit will be evaluated against predicted performance and the effect of scale-up compared with a prior 200 watt model.

Bottoming Cycles Development: Increased performance of the low temperature waste heat driven organic Rankine cycle (ORC) could be achieved through the development of tailored organic fluids. Bottoming cycle cogeneration systems operating in the 700°F and higher temperature range would achieve widespread use if they were developed to be economically available. These systems could add another 4000 MW of electrical power generation and save 0.25 quad of energy annually.

In FY 1986, performance evaluation of a composite material BiPhase separator, will be completed. In addition, laboratory testing of selected ORC working fluids will be continued. Evaluation of these ORC fluids under realistic operating conditions will determine their limitations and permit modification or "tailoring" of the organic fluids to overcome these limitations for use in improved ORC systems.

	FY 1985	FY 1986	FY 1987 Request
Industrial Process Efficiency	$10,712,000	$19,551,000	$ 5,479,000

The FY 1987 Congressional Budget Request is $5,479,000. This is $14,072,000 less than the FY 1986 Appropriation.

The Industrial Process Efficiency subprogram supports activities which reduce the technical and economic risks which prevent industry from investing in more energy-efficient processes, technologies and practices. It cost-shares research and development activity which industry would not undertake on its own for a variety of reasons. The technical issues addressed vary significantly among projects. They include, for example, such matters as understanding basic chemical reactions; the investigation and specification of materials properties: testing and application of advanced microprocessor, laser and other technologies to improve the measurement of chemical and mechanical properties; and bench scale tests to determine feasibility of new processes. Projects undertaken are continued to the point where the combination of risk and return on investment will result in private sector investment.

R&D on steel processing, including thin slab and thin strip casting of steel will be concluded in 1986. The thin slab contract with U.S. Steel and Bethlehem will be stopped before procurement of pilot plant equipment. This will require specific legislative authorization, as the FY 1984 and FY 1985 approriations require DOE support of the technology through the pilot plant stage. FY 1987 funds will be for completion of tests on laboratory scale equipment, primarily the 17 inch wide horizontal twin belt caster. Further development of the single wheel casting approach will not be supported.

There will be a reduction of approximately two-thirds in research on more energy-efficient smelting of aluminum and termination of further work on development of dry coating technologies. With funds requested for FY 1987, investigations into and testing of electrode materials at Pacific Northwest Laboratories will be cut back and basic materials research at MIT will be terminated. Funding for further dry coating development at Georgia Tech is not included in the budget request. In the area of sensors, the FY 1987 request will support continuation of research started with prior year budgets; however, R&D on new sensors is not anticipated.

Priorities in the FY 1987 Congressional Budget Request include the following areas: (1) Process electrolysis; (2) Materials processing; (3) Sensors and controls; and (4) Separation systems.

Process Electrolysis: Products such as aluminum, magnesium, chromium, manganese and chlor-alkali are manufactured using the energy intensive electrolytic reduction process. Electrolysis requires more than 1.1 quads of energy annually to reduce alumina and magnesium, and to produce chlor-alkali. The energy use efficiencies are typically less than 50 percent. The industries potentially affected have been averse to spending significant amounts of limited capital on intensified research and development activity to reduce energy consumption.

In the aluminum industry, for example, DOE is sharing the developmental costs for technologies which could reduce the electrical requirements from 7 to 5.0 Kwh per pound or lower. New cathodes could provide a wettable surface to aluminum. By forming a very thin, even and non-surging coating of aluminum on the surface of the cathode, the anode-cathode spacing can be reduced. In addition,-candidate materials must possess excellent corrosion resistance to both aluminum and cryolite bath, with a high melting point which would enable them to withstand the elevated temperatures generated in the cell. Proprietary titanium diboride containing materials have been tested to date. Utilizing the experience gained to date and the laboratory equipment which has been developed, materials with varying compositions will continue to be tested.

Promising non-consumable anode and stable cathode materials have been developed. Testing and optimization are being undertaken. New methods of material application, resistant layer formation and attachment methods are being investigated. Success in these programs, combined with sensor development, will allow small scale testing in a self sustaining cell. Energy savings of approximately 25% are anticipated by the reduction of the anode-cathode distance. Additional energy savings will result from steady state operations over long periods of time with no anode change necessary. The most promising inert anode materials and fabrication techniques will continue to be tested. During FY 1987, additional work on selection and testing of candidate materials will be accomplished. Studies of bath chemical structure will be completed.

Materials Processing: A major change in steel processing is being investigated through two programs aimed at direct casting of thin steel slabs (.5 to 1.0 inch thick) or thin steel strip with thickness of approximately 0.050 inch. The potential energy savings associated with direct strip casting is 0.20 quad per year, based on avoidance of reheating, improved yield and less energy to roll a typical heavy cross section.

The thin slab program started in FY 1985, with initial work including feasibility studies, mathematical modeling of horizontal and vertical feeding designs, and construction/operation of a liquid steel test rig for horizontal machines. Parallel with this work was a major effort devoted to conceptual and detail design of a 17" horizontal twin belt casting machine, construction of which began in FY 1985.

In FY 1986 the testing of molten steel feeding systems will be made more rigorous by means of a 10 ton prototype system to test durability and performance of refractories. A smaller lab model of the vertical feeding design will be based on 2 tons of liquid steel throughput. Based on these tests, the final design of the feeding system is to be chosen by June 1986. The 17" horizontal simulator twin belt caster installation is scheduled for completion in April 1986, with start-up in June 1986. Extensive tests of laboratory scale casting systems will be performed during the first half of FY 1987. Product evaluation from these trials will be completed before choosing a casting direction for the pilot test unit. Work could then begin on a machine to produce thin slabs approximately 50 inches wide.

The second project on direct casting involves technology development of thin strip steel casting with a thickness of.050 inch. The effort in FY 1985 was devoted to design, construction and installation of a water cooled wheel caster for producing a strip 4" wide. In FY 1986 the machine will be operated to produce 500 lb batches of steel for proof-of-concept, concluding that activity.

Sensors and Controls: Industry has found energy and process efficiencies are greatly enhanced through the use of automatic process control systems based on use of computers. The petroleum refining and petrochemicals industries which operate multi-process integrated plants were early practitioners of integrated automatic control. As the pulp and paper, steel, food processing, textile finishing and other industries move toward automatic process control, they have found the lack of accurate, on-line sensors to measure process parameters to be a serious hindrance. A major limitation on the use of process control systems is the lack of appropriate sensors which will operate in the environmental extremes of many industrial processes.

In cooperation with industry, DOE has initiated programs designed to meet some of the needs for sensors in the steel, aluminum, pulp and paper, textile and food industries. During FY 1987, research on means to accomplish in-situ chemical analysis of molten steel will be completed. Development of sensors which measure the dissolved alumina content in molten electrolyte, as well as in-situ measurement of other chemical constituents of the electrolyte and its temperature, would improve aluminum industry efficiency, and will be addressed with the FY 1986 program.

In conjunction with the pulp and paper industry, projects underway include a program to improve the wet pressing operation in papermaking, as well as sensors to measure important parameters in black liquor combustion, steam flow, pulp consistency to the paper machine, and moisture content of paper in the dryer. A number of these sensors are also potentially applicable to the textile and food industries. In FY 1987 the most promising sensors will be tested in grain drying, textile mill, paper manufacturing and other industrial plants.

Separation Systems: A critical and energy intensive step in many industrial processes is the separation/concentration of one or more chemical components in a solution or mixture. Typically the operation is effected through thermal evaporation, distillation or drying. These unit operations are usually the most energy-consuming on any manufacturing site. Alternative technologies which can be used to perform the required operations are intrinsically less energy-intensive. Such methods include membrane separations; freeze concentration; solvent extraction; critical fluid extraction; advanced drying concepts and others. Engineering development and process research work are required to apply these energy-conserving technologies to a multitude of industrial process streams.

Estimates place annual industrial energy consumption for evaporation and distillation alone at 2.6 quads. In addition, large amounts of heat and reusable chemicals are also lost in industrial, contaminated, hot process wastewater streams because no adequate separation technology is available. Large quantities of energy are used to remove water from process streams, and large amounts of it are lost in contaminated hot process wastewater solutions. The highly specialized technologies required to reduce this energy consumption have applications in many industries, no one of which generally has the incentives and/or capital to perform the work on its own. Further, much of the innovative work is being conducted by small engineering companies and universities which do not have the research funds to devote to these applications.

During FY 1985 and prior years, laboratory development and testing programs have been carried out for a variety of freeze concentration and membrane concepts. During FY 1986, basic research leading to improved understanding of the drying process will be accomplished, and completion of bench-scale tests on hydride freeze applications in the food industry.

FY 1987 activities will include completion of on-site testing of membranes for organic stream separations, concentration of various foods and caustic solutions. Development will continue on advanced drying processes and black liquor combustion.

	FY 1985	FY 1986	FY 1987 Request
Implementation and Deployment:	$ 2,212,000	$ 2,978,000	$ 500,000

The FY 1987 Congressional Budget Request is $500,000. This is $2,478,000 less than the FY 1986 Appropriation.

The Implementation and Deployment program is characterized by a cooperative effort between government and industry to enhance industry awareness about the necessity of energy efficiency improvements and the cost effectiveness of investment in energy conservation. For a variety of reasons, an information gap often exists between the source of a technology and potential users. Significant energy savings are achievable if these gaps can be closed through an effective program of technology and information transfer.

The FY 1987 funding level requested results from the phase-out of: the industrial energy efficiency improvement reporting program and the Energy Analysis and Diagnostic Center energy audits for small manufacturers. For the reporting program, legislative repeal will be necessary to eliminate related statutory requirements of the Energy Policy and Conservation Act, as amended. FY 1987 funds will support scaled-back technology transfer activities, continuing to include technical seminars, symposia and publications.

Workshops and Seminars: This project provides cooperative support in the conduct of workshops, seminars and technical symposia on industrial energy conservation. Support may be provided for events both initiated and cosponsored by the DOE. Representative activities receiving past support have been the Industrial Energy Conservation Technology Conference and Exhibition sponsored by the Texas Public Utility Commission, and the World Engineering Conference held annually by the Association of Energy Engineers. Additional activities will be conducted as opportunities arise, having as their objective more effective technology transfer and improved energy productivity. Cooperative presentations will be made, on both specific technologies and general process improvements, with the major industrial trade associations and, as appropriate, national engineering and professional societies.

In FY 1987 support for selected industry, association and professional society conferences will continue at a reduced level. Targeted industry workshops and seminars will be conducted, with particular focus on technologies which have been developed with DOE support. These seminars will be implemented with the assistance of credible industrial associations and professional organizations. Attendees will be manufacturers and equipment producers who are in a position to make decisions which directly influence energy efficiency.

Publications: Information publication and dissemination are important elements of technology transfer. Publications concerning new and underutilized energy efficient technologies, with particular emphasis on those which have been developed with the assistance of the DOE, will be produced and distributed. These publications cover not only specific technologies but also address overall energy management for major industrial sectors.

With FY 1987 funds, development, review and publication of written materials, which provide information on projects sponsored by the DOE, will be accomplished. The specific publications will be determined by the status of individual projects and the nature of the intended audience. In general, publications will be produced with close cooperation and guidance from industrial associations, manufacturing corporations and/or professional engineering societies.

	FY 1985	FY 1986	FY 1987 Request
Program Direction:	$ 1,807,000	$ 2,016,000	$ 1,844,000

The FY 1987 Congressional Budget Request is $1,844,000. This is $172,000 less than the FY 1986 Appropriation. The request of $1,844,000 is for 26 full-time equivalent positions for conducting the program.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE
TRANSPORTATION
ENERGY CONSERVATION
(Tabular dollars in thousands. Narrative material in whole dollars.)

	FY 1985 Appropriation	FY 1986 Appropriation	FY 1987 Base	FY 1987 Request	Request vs Base
Transportation (CE)					
Vehicle propulsion R&D:					
Operating expenses	$31,569	$32,085	$32,085	$ 6,500	$-25,585
Alternative fuels utilization:					
Operating expenses	2,430	1,489	1,489	1,260	-229
Electric and hybrid vehicle R&D:					
Operating expenses	8,349	8,586	8,586	4,140	-4,446
Transportation systems utilzation:					
Operating expenses	1,650	887	887	0	-887
Advanced materials development:					
Operating expenses	6,021	8,646	8,646	6,500	-2,146
High temperature materials laboratory:					
Operating expenses	0	289	289	0	-289
Construction	6,469	2,515	2,515	0	-2,515
Subtotal	6,469	2,804	2,804	0	-2,804
Capital Equipment	2,940	0	0	0	0
Program direction					
Operating expenses	1,913	2,140	2,140	1,400	-740
Total					
Operating expenses	51,932	54,122	54,122	19,800	-34,322
Capital equipment	2,940	0	0	0	0
Construction	6,469	2,515	2,515	0	-2,515
Total, Transportation	$61,341	$56,637	$56,637	$19,800	$-36,837
Staffing Total FTE's	33	36	36	22	-14

Authorization:
P.L. 93-577, "Federal Non-nuclear Energy Research and Development Act of 1974"
P.L. 93-275, "Federal Energy Administration Act of 1974"
P.L. 94-438, "Energy Reorganization Act of 1974"
P.L. 94-163, "Energy Policy and Conservation Act"
P.L. 94-413, "Electric and Hybrid Vehicle Research, Development and Demonstration Act of 1976"
P.L. 95-91, "Department of Energy Organization Act"
P.L. 95-238, "Department of Energy Authorizations for FY 1978"
P.L. 96-512, "Methane Transportation Research, Development and Demonstration Act of 1980"

Department of Energy

FY 1987 Congressional Budget Request

Adjustments to FY 1986 Appropriations

	FY 1986 Conference	General Reduction	Management Initiatives	Pay Cost Restoration	Gramm-Rudman-Hollings Reduction	Adj. Approp. Total
Transportation						
Vehicle propulsion R&D						
Operating expenses.....	$34,470	$ -202	$ -741	$ ---	$ -1,442	$ 32,085
Electric and hybrid vehicle R&D						
Operating expenses.....	9,225	-55	-198	---	-386	8,586
Transportation systems utilization						
Operating expenses	950	-3	-20	---	-40	887
Alternative fuels utilization						
Operating expenses	1,600	-10	-34	---	-67	1,489
Advanced materials development						
Operating expenses	9,290	-56	-200	---	-388	8,646
Program direction						
Operating expenses	1,775	-10	-49	+521	-97	2,140
Capital equipment						
High temperature materials lab.						
Operating expenses.....	---	---	---	---	--	---
Construction	3,010	-15	-65	---	-126	2,804
Subtotal, Transportation ..	$60,320	$ -351	$-1,307	$ +521	$ -2,546	$ 56,637
General Reduction:						
Operating Expenses	$ -336	$ +336	$ ---	$ ---	$ ---	$ ---
Construction	-15	+15	---	---	---	---
Total, General Reduction ..	$ -351	$ +351	$ ---	$ ---	$ ---	$ ---
Management Initiatives:						
Operating Expenses	$-1,242	$ ---	$+1,242	$ ---	$ ---	$ ---
Construction	-65	---	+65	---	---	---
Total, Management Initiatives	$-1,307	$ ---	$+1,307	$ ---	$ ---	
Pay Restoration	+521	---	---	-521	---	---
Total, Transportation	$ 59,183	$ ---	$ ---	$ ---	$ -2,546	$ 56,637
Operating Expenses	$ 56,253	$ ---	$ ---	$ ---	$ -2,420	$ 53,833
Capital Equipment	--	---	---	---	---	---
Construction	2,930	---	---	---	-126	2,804

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF CHANGES
TRANSPORTATION
ENERGY CONSERVATION
(In thousands of dollars)

FY 1986 Appropriation enacted	$56,637
Program increases and decreases:	
Vehicle Propulsion R&D	
- complete proof-of-concept automotive gas turbine development	-13,957
- initiate follow-on gas turbine ceramic component development	+ 4,000
- conclude automotive Stirling engine development	-13,957
- continue adiabatic diesel research and development	- 291
- eliminate technology assessment and transfer activities	- 1,380
Subtotal	-25,585
Alternative Fuels Utilization	
- continue data collection and analysis of methanol-fueled vehicles	+ 220
- reduce synthetic fuels and conclude methane investigations	- 449
Subtotal	- 229
Electric and Hybrid Vehicle R&D	
- reduce battery R&D for EV application	- 1,025
- complete design phase only of ETX-II propulsion system	- 1,380
- eliminate data collection, site operator support, and test and analysis of vehicle technologies	- 1,925
- eliminate technology assessment and transfer activities	- 116
Subtotal	- 4,446
Transportation Systems Utilization	
- eliminate publication and distribution of Gas Mileage Guide and energy data collection and analysis	- 887
Advanced Materials Development	
- reduce R&D on structural ceramics for advanced heat engine application	- 2,146
High Temperature Materials Laboratory	
- funding for operational support included in Energy Research budget request under the Basic Energy Sciences Decision Unit	- 289
- complete funding requirements for HTML construction	- 2,515
Subtotal	- 2,804
Program Direction	
- reduce staffing level by 14 FTE	- 740
FY 1987 budget request	$19,800

Program Objectives and Strategy:

The objective of the transportation program is to perform research and development on vehicles and engines which will increase the fuel efficiency of the transportation system and allow a switch from petroleum to electricity and alternative fuels. The strategies used to achieve these objectives are to: (1) establish proofs-of-concepts for advanced engine technology that have at least a 30 percent improvement in fuel efficiency over comparable conventional engines, meet emission, safety, and noise standards, have alternative fuels capability, and have competitive production costs; (2) develop technology for heavy duty diesel operation under uncooled and minimum friction conditions, having the potential of 30-40 percent fuel economy improvement over 1982 technology; (3) advance battery and propulsion system technology for competitive electric and hybrid vehicles for passenger car, van, or light truck application; (4) establish a fundamental ceramic and advanced materials technology base for heat engines; and (5) develop a utilization-oriented data base on switching from petroleum to fuels made from oil shale, coal, and biomass.

Accomplishments for FY 1985 and anticipated accomplishments for FY 1986:

- Operated ceramic turbine rotors up to 100 percent of engine design speeds in both the AGT-100 and the AGT-101 at reduced temperatures and power.
- Completed rig qualifications of AGT-101 ceramic static components at design temperature of 2500°F.
- Completed successful operation of the AGT-100 low-emission, pilotless ceramic combustor over the full engine design range.
- Completed design of the MOD II Stirling engine and initiated procurement of long leadtime hardware.
- Completed over 10,000 hours of engine test time on the MOD I Stirling engine design.
- Completed fabrication of first generation ceramic coated piston rings for adiabatic diesel evaluation.
- Completed characterization of friction and wear properties of candidate ceramic materials for use in adiabatic diesel piston ring and cylinder liner applications.
- Completed the development of an advanced single-shaft a.c. powertrain including installation in a test bed vehicle and dynamometer testing on the Federal Urban Driving Cycle with an experimental zinc-bromine battery.
- Completed the preliminary design and mission analysis for the dual-shaft a.c. propulsion system for an electric van application incorporating nickel-iron battery and field-oriented control electronics.
- Completed module development and battery subsystem design for advanced tubular-plate and sodium-sulfur technologies.
- Completed characterization testing of the GM Bedford electric vans and the Eaton a.c. propulsion system at the Idaho National Engineering Laboratory.
- Completed field test evaluations of battery thermal management systems, nickel-zinc battery systems, state-of-charge meters and the battery watering wand that demonstrated a reduction in watering time of up to 75 percent.
- Published and distributed approximately 3,000,000 copies of the 1985 model year Gas Mileage Guide.

- o Initiated introduction of methanol-fueled vehicles into the Federal fleet and established data collection and support procedures.

- o Completed first-phase research effort to determine substitution for cetane method in measurement and specification of ignition quality with synthetic fuels.

- o Completed development of a low thermal conductivity silicon carbide whisker reinforced mullite ceramic composite with greatly improved strength and toughness.

- o Completed development of ceramics-to-metal brazing techniques with application to piston cap and turbine/rotor shaft attachments.

- o Completed development of techniques for sol-gel coating of ceramic whiskers to enhance matrix/whisker interfacial properties.

- o Completed development of a transformation toughened ceramic alloy capable of long time 1,000°C operation.

- o Completed construction of the High Temperature Materials Laboratory at ORNL (end of FY 1986 or early FY 1987).

Vehicle Propulsion R&D ..... $ 6,500,000

The Vehicle Propulsion R&D FY 1987 budget request is $25,585,000 less than the adjusted FY 1986 Appropriation for these activities. The proof-of-concept Automotive Gas Turbine Program is scheduled to be completed in FY 1986, and the FY 1987 request includes the initiation of a less costly follow-on program for component development. The proof-of-concept Automotive Stirling Engine Program will be concluded in FY 1986, and no funding will be required in FY 1987. The Heavy Duty Transport Program, focused on the adiabatic diesel, will essentially continue at FY 1986 levels. The Technology Assessment and Transfer activities will be eliminated as separate activities in FY 1987. Technology transfer will be achieved through the industry involvement in specific program areas.

The goal of the Vehicle Propulsion R&D program is to encourage development within the automotive industry of more fuel-efficient, fuel-flexible and cost-effective transportation heat engine propulsion system options through support of research and development on technological barriers and proofs-of-concepts.

The technical objectives of the Vehicle Propulsion R&D program are: (1) achieving at least a 30 percent improvement in fuel economy over conventional heat engines, (2) meeting or exceeding established requirements for regulated emission levels, and (3) operating satisfactorily on a wide variety of fuels. To accomplish these objectives, research and development has been pursued on advanced heat engine concepts including the automotive gas turbine, the automotive Stirling engine, and the heavy duty adiabatic (uncooled, minimum friction) diesel engine. Common to the needs of all advanced heat engine concepts is the requirement to develop improved high-temperature materials and components.

The FY 1987 funding is necessary to allow continuation of the research and development activities required to establish an industry technology base on high-temperature, uncooled, minimum friction diesel engines. An uncooled, or adiabatic, heavy duty diesel engine integrated with a waste heat recovery technique has the potential for efficiency improvements in the 30 to 40 percent range. An industry assessment has provided identification of the technological barriers, and a phased development approach has been designed. The request will fund planned activities in ceramic component evaluations in a single-cylinder, uncooled engine; performance analyses of a baseline adiabatic diesel design; initial experimental emissions evaluations; upper-cylinder interface analyses and evaluations; and high-temperature engine heat transfer computer models. The funding will also provide for a follow-on program to

continue ceramic component development for an automotive gas turbine engine. Although the Automotive Gas Turbine program (AGT), to be completed in FY 1986, will demonstrate the feasibility of the engine concept, further research and development on ceramic components processing and reliability is required before industry will consider the engine for commercialization. The program will utilize engines fabricated under the AGT program for test beds, and basic ceramic technology research results from the Advanced Materials Development program for improved component fabrication and evaluation. The Automotive Stirling Engine (ASE) Program will be concluded in FY 1986, and program results and experimental engines will be made available to industry.

Alternative Fuels Utilization ..... $ 1,260,000

The FY 1987 budget request for Alternative Fuels Utilization is $229,000 less than the adjusted FY 1986 Appropriation but essentially covers a continuation of FY 1986 activities. Funding is included for continuing data collection and analysis on Federal fleet methanol-fueled vehicles which was funded in FY 1986 with unexpended prior year obligations. Research and development projects on synthetic fuels utilization are stretched out. Investigations on methane utilization will be concluded in FY 1986.

The goal of the Alternative Fuels Utilization program is to accelerate the introduction of nonpetroleum-based transportation fuels by establishing a technology base for utilization of synthetic, biomass-derived, and gaseous fuels in both contemporary and advanced propulsion systems.

The FY 1987 funding is necessary to allow continuation of research and development activities focused on performance, emissions, optimization and wear characteristics of conventional and advanced engines using synthetic fuels derived from oil shale and coal syncrudes. Tests and evaluations are conducted on both single-cylinder and multi-cylinder engines, and the program will continue to provide industry and the scientific community with standardized synthetic test fuels. The funding will also allow continuation of the collection and analysis of data from the methanol-fueled vehicles operated as part of the Federal fleet.

Electric and Hybrid Vehicle R&D ..... $ 4,140,000

The Electric and Hybrid Vehicle R&D FY 1987 budget request is $4,446,000 less than the adjusted FY 1986 Appropriation for these activities. A major change in the FY 1987 request is due to the decision to complete the design phase only of the second-generation, single-shaft a.c. propulsion system (ETX-II) with termination of hardware fabrication. The development of the dual-shaft a.c. propulsion system will be continued in FY 1987 but at a lower level of effort and an extension of the schedule. Three final battery candidates will be selected from the six under development in FY 1986 for further development in FY 1987. Site operation testing, field evaluation, and data collection and analysis of available battery and drivetrain component technologies will be concluded and laboratory testing phased out in FY 1987. The data base results will be published and made available to industry developers. Technology assessment and transfer activities will be eliminated as a separate activity in FY 1987. Substantial industry participation in the development activities will provide effective technology transfer in current technology areas.

The goal of the Electric and Hybrid Vehicle program is to develop the technology in cooperation with industry that will lead to the production and introduction of electric vehicles into the Nation's transportation fleet and substitute more abundant sources of energy for petroleum-based fuels.

The FY 1987 funding is necessary to continue the development of an advanced lead-acid battery technology based on the flow-through electrolyte concept for improved energy density, sustained power density and longer life. The request will fund the continuation of development of the promising sodium-sulfur and zinc-bromine battery

technologies for the electric vehicle application including thermal management and system optimization. Funding is necessary to continue development of the advanced dual-shaft propulsion system technology, including the integration of nickel-iron battery technology, towards a level of maturity that will allow industry to make a quality decision regarding its viability.

Transportation Systems Utilization ..... $ 0

No funds are being requested for the publication and distribution of the Gas Mileage Guide. Gas mileage information is required on the stickers of all new cars. DOE will submit a legislative initiative to remove the mandatory printing and distribution of the Guide. DOE will encourage the private sector (automobile publications and newspapers) to print the fuel economy information when it is released each new model year by the Environmental Protection Agency. This approach is capable of reaching a much wider audience than DOE publication of the Guide.

The collection, analysis, and presentation of transportation energy data in the Transportation Energy Data Book will not be continued. DOE will rely on the private sector to provide analysis of current energy usage and projections of transportation activity and energy use.

Advanced Materials Development ..... $ 6,500,000

The FY 1987 budget request for Advanced Materials Development is $2,146,000 less than the adjusted FY 1986 Appropriation for similar activities. The decrease results from focusing the materials effort onto the highest-payoff areas and making effective use of the new High Temperature Materials Laboratory where such efforts are being consolidated.

The goal of the Advanced Materials Development program is to develop an industrial technology base in structural ceramics, ceramic composites, and coatings capable of providing reliable and cost-effective components for high-temperature, efficient transportation propulsion systems while eliminating requirements for scarce strategic materials.

The efficiency and economics of advanced heat engines are materials limited, and utilization of high-temperature ceramic components and coatings is a key technology need. Although ceramics have demonstrated the potential temperature and environmental resistance capabilities necessary, substantial research is required to achieve adequate strength, toughness, and other specific properties needed before reliable ceramic components can be produced commercially. The technology developed within the program, as well as the availability of the High Temperature Materials Laboratory being constructed under the program at Oak Ridge National Laboratory, will have significant spinoffs for increasing the efficiency and productivity of a wide range of other industrial applications in addition to transportation.

The funding in the FY 1987 request is necessary to continue phased activities on existing contracts and research projects and initiate some new research projects essentially in accordance with a limited stretch-out of the Ceramic Technology for Advanced Heat Engines Program Plan. The program activities will include projects on materials and processing of monolithic silicon nitride and silicon carbide, oxide matrix and dispersion toughened composites, thermal and wear zirconia-based coatings, and ceramic-to-metal and ceramic-to-ceramic joining; materials design methodology for dynamic interfaces; data base/life prediction for time dependent behavior; IEA Standardization; and program management and coordination.

High Temperature Materials Laboratory ..... $ 0

The FY 1987 budget request does not include funding for the High Temperature Materials Laboratory (HTML) since the final increment of required construction funds was appropriated in FY 1986. During FY 1987 the HTML will initiate operations, and begin

placement of personnel for the permanent User Staff. Based on the fundamental and cross-cutting nature of the operations to be conducted at the HTML, funding for the operational research staff will be included in the Basic Energy Sciences budget of the Office of Energy Research beginning in FY 1987. The Transportation Appropriation for FY 1986 included funding for pre-operational support during construction of the HTML, and this change plus the completion of construction funding accounts for a total reduced need of $2,804,000 from FY 1986.

Program Direction ..... $ 1,400,000

The FY 1987 budget request for Program Direction is $740,000 less than the adjusted FY 1986 Appropriation, as a result of a reduction of 14 FTE positions. The funds requested provide for 22 FTE positions to develop strategies, plans and resource requirements, and provide the integrated program management necessary to conduct the research and development of the various transportation technologies described in the budget request.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
ENERGY CONSERVATION
MULTI-SECTOR
LEAD TABLE

(Tabular Dollars In Thousands. Narrative Material In Whole Dollars)

	FY 1985 Appropriation	FY 1986 Appropriation	FY 1987 Base	FY 1987 Request	Request Vs Base
Multi Sector (CE)					
National Appropriation Technology and Assistance Service					
Operating Expenses	$ 1,470	$ 1,396	$ 1,396	$ 750	$ -646
Capital Equipment	---	---	---	---	---
Subtotal	$ 1,470	$ 1,396	$ 1,396	$ 750	$ -646
Energy Related Inventions Program					
Operating Expenses	$ 4,900	$ 4,653	$ 4,653	$ 3,300	$-1,353
Capital Equipment	---	---	---	---	---
Subtotal	$ 4,900	$ 4,653	$ 4,653	$ 3,300	$-1,353
Energy Conversion and Utilization Technologies					
Operating Expenses	$15,463	$18,097	$18,097	$15,200	$-2,897
Capital Equipment	1,666	930	930	100	-830
Subtotal	$17,129	$19,027	$19,027	$15,300	$-3,727
Program Direction (ECUT)					
Operating Expenses	$ 292	$ 498	$ 498	$ 500	$ +2
Subtotal	$ 292	$ 498	$ 498	$ 500	$ +2
Total					
Operating Expenses	$22,125	$24,644	$24,644	$19,750	$+4,894
Capital Equipment	1,666	930	930	100	-830
Subtotal	$23,791	$25,574	$25,574	$19,850	$-5,724
Total, Multi-Sector	$23,791	$25,574	$25,574	$19,850	$-5,724
Total FTE's	4*	9*	9*	8*	-1

Authorization: P.L. 93-577, Federal Nonnuclear Research and Development Act of 1974.
P.L. 95-91, Department of Energy Organization Act.

*FTE and associated costs are for Energy Conversion and Utilization Technologies only.

Department of Energy

FY 1987 Congressional Budget Request

Adjustments to FY 1986 Appropriations

	FY 1986 Conference	General Reduction	Management Initiatives	Gramm-Rudman-Hollings Reduction	Adj. Approp. Total
Multi-Sector (CE)					
National Appropriate Technology and Assistance Service					
Operating Expenses	$ 1,500	$ -9	$ -32	$ -63	$ 1,396
Energy Related Inventions Program					
Operating Expenses	5,000	-30	-108	-209	4,653
Energy Conversion and Utilization Technologies					
Operating Expenses	19,440	-112	-418	-813	18,097
Capital Equipment	1,000	-6	-22	-42	930
Subtotal	$20,440	$ -118	$ -440	$ -855	$19,027
Program Direction (ECUT)	535	-3	-12	-22	498
Subtotal, Multi-Sector	$27,475	$ -160	$ -592	$-1,149	$25,574
General Reduction:					
Operating Expenses	$ -154	$ +154	$ ---	$ ---	$ ---
Capital Equipment	-6	+6	---	---	---
Total, General Reduction	$ -160	$ +160	$ ---	$ ---	$ ---
Management Initiatives:					
Operating Expenses	$ -570	$ ---	$ +570	$ ---	$ ---
Capital Equipment	-22	---	+22	---	---
Total, Management Initiatives	$ -592	$ ---	$ +592	$ ---	$ ---
Total, Multi-Sector (CE)	$26,723	$ ---	$ ---	$-1,149	$25,574
Operating Expenses	$25,751	$ ---	$ ---	$-1,107	$24,644
Capital Equipment	972	---	---	-42	930

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF CHANGES
ENERGY CONSERVATION
MULTI-SECTOR
(in thousands of dollars)

FY 1986 Appropriation enacted	$25,574
Program increases and decreases:	
Energy Conversion and Utilization Technologies	
Combustion and Thermal Sciences:	
Eliminate research on microemulsion fuels technology, advanced heat transfer, and direct contact heat exchanger	-1,226
Materials:	
Maintain level of effort in high-temperature materials and materials-by-design research; terminate research on lightweight and corrosion-resistant materials	-184
Catalysis/Biocatalysis:	
Terminate research on direct use off enzymes in biochemical reactors and in catalysis-by-design	-192
Tribology:	
Eliminate research on mechanisms of friction and wear of ceramics and reduce level of effort in lubricants, tribological coatings, and data retrieval system	-1,355
International Research Monitoring:	
Maintain minimum level of tracking international energy conservation research	-40
Conservation Program Analysis and Planning:	
Initiate Conservation program oversight and long-range planning activity	+100
Energy-Related Inventions Program	
Reduce number of grants awarded by DOE for ERIP	-1,353
National Appropriate Technology and Assistance Service	
Reduce funding for NATAS	-646
Capital Equipment	
Reduce capital equipment for national laboratories and Historically Black Colleges and Universities	-830
Program Direction	
Reduce number of FTE's for ECUT from 9 to 8	+2
FY 1987 budget request	$19,850

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
PROGRAM OVERVIEW
Energy Conservation - Multi-Sector

This request is for $19,850,000 for the Multi-Sector Conservation Program: $15,300,000 for the Energy Conversion and Utilization Technologies (ECUT) Program, $3,300,000 for the Energy-Related Inventions Program (ERIP), and $750,000 for the National Appropriate Technology Assistance Service (NATAS).

Energy Conversion and Utilization Technologies

The primary mission of the Energy Conversion and Utilization Technologies (ECUT) Program is to expand and solidify the generic technology base that supports initiatives by both the DOE end-use Conservation programs and U.S. private industry to improve the efficiency of energy conversion and utilization systems. ECUT research is aimed at understanding and improving techniques, processes, and materials that push the thermodynamic efficiency of energy conversion and usage beyond the state-of-the-art. ECUT also assesses the current state of energy conservation technologies in foreign countries to provide a comparative assessment of U.S. efforts in important conservation technologies.

There are four distinguishing features of ECUT research compared to other Department research programs: (1) it is a program of directed basic research (problem oriented) that anticipates future end-use sector needs, (2) it focuses on solving problems that may be common to more than one energy-consuming sector (for example, understanding combustion phenomena), (3) it makes a concerted effort to seek out, encourage, and support new ideas and concepts, and (4) it provides predictive models and design tools for use by the private sector to improve designs, to scale (up and down) processes, and to create new hardware aimed at achieving increased energy productivity.

ECUT currently conducts programs in four interdisciplinary research areas: Combustion and Thermal Sciences, Materials, Biocatalysis, and Tribology. Each of these activities contributes to accomplishing the following goals:

- Establish the feasibility of revolutionary concepts that offer the potential for significantly reducing energy consumption in energy conversion processes and energy end-use.
- Monitor advances in research and engineering both in the United States and abroad, and evaluate them for applicability to energy conservation.
- Carry out exploratory development on novel or innovative conservation concepts.
- Expand and place on firm footing the technology base for energy conservation technologies.
- Ensure a continual flow of information on new conservation-related technical advances to the DOE end-use sector Conservation programs and to private industry.

ECUT accomplishments for FY 1985 and anticipated accomplishments for FY 1986:

- Successfully used simplified engine experiments, flow reactor studies and real engine tests to develop and validate a comprehensive chemical kinetics model for simple fuels to study engine knock. Gained insight essential to the development of environmentally safe additives or to devise more effective fuel-blending strategies.
- Found differences in the low-temperature ignition kinetics of alternative fuels that were not evident in the traditional American Society for Testing and Materials (ASTM) cetane rating procedure. The experimental technique, which was co-funded by ECUT and the Office of Transportation Programs, provided insight

into fuel characteristics which are essential to improving the ignition and combustion properties of broad-specification fuels.

- Successfully obtained the first two-dimensional measurements of the structure of a propagating turbulent flame in an operating internal combustion engine, thus providing an essential input to the development of physically realistic, predictive models of flame propagation in engines.

- Completed first experiments using ECUT Reversing Flow Test Facility to develop performance profiles of annular regenerators. These efforts were conducted in cooperation with the Office of Buildings and Community Systems and the Office of Transportation Systems in support of the development of Stirling engine and heat pump technologies.

- Developed heat exchanger vibration analysis for accurate prediction of tube bundle instabilities. The computerized analysis capability can now be used by designers to predict the internal crossflow field for each tube in a tube bundle and to identify those tubes most likely to experience fluid elastic instability, together with the instability vibration mode.

- Licensed Ni_3Al alloy technology to Cummins Engine Company for development and use as combustion chamber materials for truck diesel engines.

- Identified an ordered metallic alloy with high-temperature (2,000°C) capabilities potentially rivaling those of ceramics.

- Filed two patent applications and one patent disclosure as result of ECUT work on reactive metal brazes to join ceramics to ceramics and/or to metals. Private industry is now showing interest.

- Developed SiC whisker reinforced Al_2O_3 ceramic composite cited by Science Digest as one of the top innovations of 1985. This composite is now being sold commercially by Greenleaf Corp. for use in cutting tools.

- Completed research which first showed feasibility of producing ceramic powders ina rotary kiln. Advanced Refractory Technology (ART), Inc. is now marketing SiC ceramic powders produced in this manner.

- Completed development of models which predict effects of aging on rigid urethane foam insulation. This has enabled Mobay Chemical and Jim Walker Corp. (Manufactured Homes) to apply these models to make better insultating foam, i.e. foam which is more stable and has a higher R-value.

- Discovered a new ductile ordered metallic alloy based on magnesium.

- Designed selective inhibitors and immobilization systems for enzymes (e.g. thermolysin) using ECUT-developed predictive models. This is important because enzymes generally lose their catalytic activity when they are tied down (immobilized).

- Demonstrated in laboratory experiments a new technique to stabilize genetic information in microorganisms. This is important because the genetic information engineered into microorganisms by the usual recombinant DNA techniques tends not to get transferred when the microorganism reproduces.

- Demonstrated a bioreactor concept that used a hydrogen gas atmosphere (as opposed to the usual oxygen environment) to increase process efficiency and product specificity.

- Demonstrated a bioreactor concept having an 80-fold increase in productivity over that of a conventional fermenter.

- Showed in laboratory experiments that a novel method of delivering elevated temperature (200^{o}-600^{o}C) lubricants from the gas phase is a workable method for lubricating machinery at these temperatures. Similar work in powdered lubricants, which offers the same promise of delivering lubricants exactly when needed, may solve some of the lubrication problems of advanced engines.

- Determined the amount of hard coatings necessary for industry to systematically implant tribological coatings for cams, gears, toolbits, etc., in order to impart less expensive substrate materials with more desireable friction and wear properties. These coatings are more than 10 times harder and only 20 percent greater in cost than state-of-the-art coatings available today.

- Established a prototype computerized data retrieval and information system that will provide the scientific and engineering community with up-to-date tribological data and information. This system will enable engine designers, for example, to manipulate mathematical models from many different sources at their work stations in a user-friendly manner. Jointly sponsored by a whole host of professional societies, this system is the first of its kind in the United States and is the result of international cooperation with Canada and West Germany.

Energy Conversion and Utilization Technologies.....$15,300,000

This request is to provide funds to expand the technology base for the Conservation program. Funding of $15,200,000 is requested for the following research areas: Combustion and Thermal Sciences, Materials, Biocatalysis, and Tribology, along with $100,000 in capital equipment for research instrumentation.

Combustion and Thermal Sciences $4,800,000

The FY 1987 request for Combustion and Thermal Sciences is $4,800,000, a reduction of $1,226,000 from the FY 1986 appropriation.

Combustion and Thermal Sciences

The ECUT Combustion Technology Research Program was established to promote the design and development of energy-conserving combustion systems and devices. Since combustion is the fundamental process for converting fuels into usable energy, improved understanding can yield significant benefits in virtually all end-use applications. Research in this program is focused to study problems associated with the development and evolution of comprehensive predictive capabilities for combustion systems.

The technical objective of the Combustion Technology Research activity is to provide a set of proven analysis and measurement techniques and a better understanding of combustion and combustion-related processes for intermittent and continuous combustion systems and devices. The ECUT activities are structured to ensure the usefulness and availability of these capabilities to designers of engines in industry. Laser-based diagnostics and multidimensional computations are used to investigate precombustion fluid motion, fuel preparation, sprays and turbulence in combustion, and emission formation mechanisms. Research groups, which include DOE national laboratories and university and industrial researchers, convene periodically to study specific combustion-related problems in engines as well as stationary combustors. Activities are designed to bridge the gap between basic research and engineering development phases of technology development. In addition, investigations of innovative combustion system concepts are conducted, e.g. pulse combustion systems and other concepts that are specially designed to improve system efficiency and fuel flexibility. Through the International Energy Agency, the Combustion Technology Research Program collaborates with the major energy consumers of the free world.

The technical outputs of the ECUT Combustion Technology Research Program include proven

advanced diagnostic techniques, experimental data, validated computer models, innovative concepts, state-of-the-art technologies and expanded scientific and technical knowledge.

The FY 1987 funding includes resources to continue activities in Engine Combustion Technology and in Continuous Combustion Technology projects. Through close interaction with industry, ECUT focuses research which has been identified as essential to the development and improvement of advanced engine concepts. These concepts are devised to improve fuel economy and enhance the ability of internal combustion engines to use alternative fuels without compromising established emission requirements. Efforts are further encouraged via an annual token cost-share from the Motor Vehicle Manufacturers Association (MVMA) to support the application of advanced diagnostic techniques. The following is a description of each project for FY 1987:

Engine Combustion Technology

The Engine Combustion Technology research project will focus on:

(1) Events that are believed to promote the occurrence of engine "knock" in dilute homogeneous-charge and direct injection stratified-charge engines. Engine knock limits an increase in compression ratio that can improve thermal efficiency of an engine and thus decrease fuel consumption. Engine knock phenomena will be investigated by examining the nature of the chemical processes and the fluid mechanics prior to, during, and just after the event. This will permit research to impact both the needs of the fuel supplier as well as those of the engine designers.

(2) Fluid mechanics/combustion interactions in internal combustion engines with particular emphasis on the importance of turbulence in the combustion process. The behavior of internal combustion engines is greatly influenced by the fluid motion in the intake manifold and within the cylinder. In-cylinder processes that govern engine performance, such as mixing, combustion, and heat transfer, are to a great extent controlled by the turbulence and bulk fluid motions.

(3) The role of sprays in diesel engine combustion with special emphasis on mixing rate of the charge air and fuel, soot formation, and emissions. The importance of emission and particulate mitigation cannot be overstated. While significant improve-ments have been realized in recent years, automobiles continue to be the largest single source of air pollution in the world today. In addition, this research will provide insight into the feasibility of multi-fuel use in such innovative concepts as pulse combustors.

(4) The role of in-cylinder convection and radiation heat transfer on engine operating efficiency. Heat losses generally account for an estimated 60 percent of the difference between ideal fuel-air cycle efficiency and indicated efficiency which translates to a 5 percent reduction in engine efficiency due to heat losses. Understanding the relationship of the various processes of heat transfer in engines will lead to a reduction of this heat loss quantity. An efficiency gain of approximately 3 percent appears attainable.

Continuous Combustion Technology

The Continuous Combustion Technology research project will continue to focus on enhancing the understanding of and providing experimentally validated analytical capabilities for spray and turbulent combustion, advanced combustion concepts, and corrosion/erosion of combustor components. In addition, special projects with relevance to enhancing the feasibility of combustion technology are pursued. These areas are described below:

(1) Spray and turbulent combustion. The ECUT program couples experimental investigations of particulates and fuel droplets with spray combustion modeling activities to study the effects of structure and physical properties of fuel on combustion. In the combustion of fuel-oil sprays, the liquid fuel drops change

into carbonaceous porous sphere-like particles called cenospheres. These cenospheres burn and the products determine the majority of the deposits found on metal surfaces, promoting corrosion/erosion. Trace compounds existing in the initial fuel drop have a much higher concentration in the cenospheres than in the original fuel. Therefore, work will be continued toward the development of a dense spray computer model which will include the formation and subsequent combustion of the cenospheres.

(2) Advanced combustion concepts. Research will continue in the area of pulse combustion. Pulse combustion is a process by which combustion of fuels is driven by self-sustained oscillations. Pulse combustors have been built in a variety of sizes and shapes and have been fired with oil, gas, and coal. However, acceptance and development of pulse combustion systems have been hindered by high noise levels and the complex underlying theory of their operation. Small changes in configuration have significant effects on performance. Designs have evolved more by trial and error and from empirical correlations than from the application of basic principles. The high combustion intensity, minimal standby losses, and potential for superior heat transfer make pulse combustion a very desirable energy-conserving technology. The coupling of experiments and modeling activities will allow for a more complete analysis capability than combustion that has been limited to natural gas as a fuel. FY 1987 efforts will continue to investigate the effect of liquid and solid fuels on the operating parameters and therefore on the performance and emissions of pulse combustion. Research will couple the apparent basic principles of combustion and heat transfer processes.

Thermal Sciences

The objective of the Thermal Sciences activity is to provide a comprehensive technology data base for use by industry to design and further the development of conversion systems and devices with enhanced performance and reliability over those currently available. Applied and exploratory research is undertaken to develop experimentally validated analysis and computerized data bases necessary to strengthen the private sector's design and development abilities.

The FY 1987 Thermal Sciences research activity will continue to serve as the focus for the relevant needs of advanced conversion system development, responding to the needs of both the private sector as well as those of the DOE and other Government-sponsored programs. Efforts are closely collaborated with industry, universities, the DOE national laboratories, and other Government-sponsored researchers. Cooperative activities are underway with the Gas Research Institute (GRI) and the DOE Buildings and Community Systems and the Transportation Programs. In addition, there is International Energy Agency collaboration in Heat Transfer and Heat Exchangers involving six participants from the free world.

In the Thermal Sciences activities, a comprehensive experimental program was initiated in FY 1985 to exploit the capabilities of the specially designed Reversing Flow Test Facility (RFTF). The RFTF is the first-of-a-kind in the United States. It was designed as an experimental facility to study the aspects of energy conversion cycles with the ability to simulate real cycle processes, in particular those characterized and affected by reversing, or oscillating, flow conditions. This effort was continued in FY 1986 to study the thermodynamics and fluid dynamics in major components of closed-cycle systems and to validate analysis methodologies currently being developed. FY 1987 activities will complete the development of improved general purpose computer models for analysis and optimization for use in the design of advanced energy conversion systems that employ such closed-cycle designs as free piston and kinematic Stirling engine systems. The experimental results from the RFTF will be used to accurately validate these and other such computer models.

The initial research for the RFTF was started in FY 1985 to investigate the aspects of regenerator theory as it relates to performance for real systems. Continued in FY 1986,

this effort has undertaken to examine flow maldistribution problems apparent in Stirling engine regenerator designs. Recent analyses of annular regenerators such as those used in free-piston and automotive Stirling engine designs have revealed the possibility that these maldistribution problems contribute to heat conduction losses, resulting in low efficiency operation. In addition, there continue to exist unexplained differences between theory and actual practice which are believed to contribute significantly to heat transfer-related inefficiencies evident in energy conversion systems. These differences are believed to be due primarily to inaccurate estimations of pressure drop for flows through complex channels and a lack of adequate understanding of actual flow conditions, i.e. steady vs. unsteady flow conditions. The continuing research focuses on the identification of controlling mechanisms in regenerator flows, with an objective to establish specific guidance for regenerator design.

Materials $5,400,000

The FY 1987 Request for the ECUT Materials Project is $5,400,000, a decrease of $184,000 from the FY 1986 appropriation.

The ECUT Materials Project seeks to identify and develop new materials and processing concepts of potential use to energy conservation. ECUT monitors and picks up on the wealth of research opportunities coming out of basic research programs, particularly those funded by the DOE Office of Basic Energy Sciences and the National Science Foundation. ECUT develops sufficient data on the properties and performance characteristics of these materials and processing concepts and conducts research to improve them to the point that either an end-use program or industrial firm will undertake engineering development or make use of the new material in its components, devices, or systems.

The requested level of FY 1987 funding is necessary to maintain most research currently underway in the areas of high-temperature materials and materials-by-design. Research on lightweight materials and corrosion resistant materials will be terminated.

High-Temperature Materials

ECUT high-temperature materials research currently underway will be continued in FY 1987 for the following:

- Ductile Ordered Metallic Alloys
- Ceramic Attachments
- Ceramic Materials.

Ductile Ordered Metallic Alloys: Metallic materials with ordered atomic structures such as long-range ordered (LRO) and intermetallic alloys have not been utilized until now despite their potential for superior performance (e.g., four times the yield strength of conventional materials at elevated temperatures) due to their characteristic brittleness. These high-temperature materials have the unusual property of increasing in strength with increasing temperature and can withstand other severe operating conditions, such as corrosive environments.

ECUT research is focused on the initial measurement and improvement of engineering properties (yield strength, ductility, creep, fracture toughness, etc.) of these materials needed by designers of future high-performance energy conservation concepts and on delineating the limits of improvability of these properties.

In early 1982, after more than 30 years of failure by numerous researchers, a breakthrough was achieved at Oak Ridge National Laboratory in the ability to make one member of the family of intermetallic compounds, nickel aluminide (Ni_3Al), highly ductile (on the order of 50%). ECUT immediately provided the major funding necessary to capitalize on this basic research breakthrough and began to support the characterization and

improvement of this material. This research will continue in FY 1987.

Like the LRO alloys, the ordered intermetallics increase in strength with increasing temperature. Presently this yield strength increases up to a certain point and then begins a gradual decline. However, no reason has yet been found why this strength should not continue to increase right up to the decomposition temperature which far exceeds $1000^{0}C$. In FY 1987 ECUT will continue research toward understanding this mechanism of increased temperature stability in nickel aluminide and applying this knowledge to other members of the intermetallic family of alloys, such as aluminides of titanium, iron, and magnesium, to name just a few.

Ceramic Attachments: ECUT ceramic joining work seeks to ensure the availability of methods to join ceramic components together whenever they can be manufactured. Such techniques are important because they will allow ceramic components to be used economically in large operational systems such as heat engines and heat exchangers.

ECUT research aims to increase the understanding of the problems and limitations inherent in joining and bonding ceramics to ceramics and ceramics to metals. In FY 1987, joining ceramic materials by means of microwave heating and verification of the residual stress finite element predictive models for both brazed and unbrazed joints for five basic joint geometries will be continued. Work to understand and model interfacial phenomena important in ceramic attachment also will be continued.

Ceramic Materials: Ceramic materials fail catastrophically through the growth and propagation of defects, particularly cracks initiated at free surfaces. The principles behind methods of toughening are to reduce the size and number of defects and to provide in the ceramic matrix a secondary phase that can absorb the crack propagation energy and arrest it. In the case of transformation toughening, a minor phase absorbs the energy by undergoing a diffusionless phase transformation to a higher energy but nevertheless stable phase. In the case of compositing approaches, a minor phase such as a fiber with some ductility is provided to absorb the energy by elastic and plastic deformation.

In FY 1987 ECUT will continue investigating the reasons for the brittleness of ceramics and will continue researching methods to toughen them by compositing and modifying their surfaces by ion implantation and other techniques. In addition, novel techniques for producing near net shape ceramic samples will be pursued.

Compositing will include combining various ceramics with the LRO alloys and/or aluminide materials discussed above. These efforts could make fabrication of reliable, high-strength ceramic components possible. The work using ion implantation and lasers to modify ceramic surfaces toughens them by arresting surface-initiated cracks.

For all of this ceramics research, an effort has been made to avoid duplication of effort throughout DOE by coordination through the DOE Energy Materials Coordinating Committee, Subcommittee on Structural Ceramics. This subcommittee has made a compilation and analysis of all structural ceramics research underway in all DOE programs having structural ceramics research components. This analysis is available upon request and shows quite clearly the major areas of focus and complementarity of the various DOE programs. Avoidance of duplication with other agencies, such as DARPA, continues to occur by information exchanges such as those which take place at the annual Interagency Coordination Meeting on Ceramics for Heat Engines. This coordination notwithstanding, efforts will be made in FY 1987 to effect the orderly transfer of ECUT-initiated ceramics research to the Ceramic Technology for Advanced Heat Engines program in the Office of Transportation Systems and to phase out ECUT's involvement in this most important area of materials research and development.

Materials-By-Design

The present practice of energy conversion system designers is to select materials on the basis of their appropriate performance characteristics and cost. In general, materials are screened on a trial and error basis to see how well they perform in a component or

system of interest (e.g., engine, heat exchanger, etc.). Although such testing will always be necessary, the selection of candidate materials on the basis of fundamental physical quantities common to all materials (e.g., the structure and bonding of the atoms or molecules in the material) is not done yet and could lead to the design of totally new and improved performance materials. In order to design materials it is necessary to understand the relationship of the desired properties (e.g., ductility) and performance characteristics (e.g., high-temperature survivability) to the structure and bonding taking place and the role of defects in the material. Given such understanding, a hierarchy of structural and bonding models can, in principle, be constructed to predict the properties to be expected of any given assembly of atoms or molecules. In FY 1984 ECUT initiated an assessment of the state-of-the-art of these models and to provide feedback on further modeling research needs for resolution by basic researchers.

Areas where this materials-by-design approach may be helpful are in the formulation and development of new high-temperature alloys, coatings, and polymers.

Actual research was begun in FY 1985 to capitalize on advances in theory and experimentation coming from basic materials research sponsored by the DOE Office of Basic Energy Sciences. The approach is to apply to materials design problems a combination of the unique experimental and theoretical tools put in place by this same basic research program at the DOE national laboratories in a concerted effort to make use of basic knowledge of the relationship between bonding and structure at the atomic level to selected materials related problems of importance to energy conservation. Application to interfacial phenomena, e.g., adhesion of coatings to substrates, catalytic mechanisms, grain boundary bonding in intermetallic alloys, and bond energies at tribological surfaces are particularly important to energy conservation. In FY 1987 research will be continued to model trial structures of grain boundaries in Ni_3Al with the goal of applying knowledge gained to design new and different intermetallic alloys.

The potential economic importance of this initiative may be seen by a brief consideration of the fact that for just the binary intermetallic alloys (those composed of only two basic elements like nickel and aluminum) there are over 3,700 possible combinations. Each combination potentially represents a totally new material such as the Ni_3Al discussed above. In order to screen and try out each and every one of these 3,700 alloys would be a very expensive and time-consuming task. However, if reliable computer models were available to predict the most promising combinations, only these few would actually have to be tested and experimentally proven in the laboratory.

Catalysis/Biocatalysis $2,400,000

The FY 1987 request for the ECUT Biocatalysis Program is $2,400,000, a decrease of $192,000 from the FY 1986 appropriation. This level of funding will maintain research already underway in bioprocess engineering.

An Office of Technology Assessment (OTA) report, "Commercial Bio-Technology, An International Analysis," stated in the foreword:

> Although the United States is currently the world leader in both basic science and commercial development of biotechnology, continuation of the initial preeminence of American companies in the commercialization of biotechnology is not assured. In the next decade, competitive advantage in areas related to biotechnology may depend as much on developments in bioprocess engineering as on innovations in genetics...and other areas of basic science.

The OTA report essentially identified bioprocess engineering applied research as the weakest link in the U.S. biotechnology research effort.

ECUT recognized this deficiency in support for generic applied bioprocess engineering some 5 years ago and for this reason has been focusing its efforts on bioprocess engineering research.

Bioprocess Engineering

With the advent of recombinant DNA techniques for engineering specific capabilities into microorganisms, it became possible in principle to produce enzymes (biocatalysts) on demand for carrying out specific chemical reactions. ECUT focuses on resolving major generic technical barriers (such as lack of kinetic data and scale-up equations) that impede the use of genetically engineered microorganisms to carry out biologically catalyzed (biocatalyzed) continuous chemical production processes. Such processes have the potential to save process energy not only because of the ability of biocatalysts to carry out exactly the desired chemical reaction in one step (thereby avoiding large energy inputs for intermediate product purification and separation) and at the mild reaction conditions prevailing in biocatalyzed reactions but also to make use of renewable or more abundant feedstock than conventional chemical processes.

A typical problem being researched in genetically engineered microorganisms is the stabilization of the genetic information which has been inserted to make the organism produce desired chemicals. Usually some of this information is lost each time the microorganism divides. While this loss of genetic information is not a great problem in bench scale (1 cubic meter size) fermenters, it can be a major problem for industrial scale (1000 cubic meter size) continuous processes where the microorganisms reproduce millions of times, perhaps to the point where in a very short time none of the useful genetically engineered microorganism is left. This is just one example of the kinds of problems encountered by biochemical engineers who want to design and scale up biocatalyzed production processes; ECUT has made major strides in solving this particular problem by inserting the desired genetic information directly into the cellular chromosomes where it cannot be lost upon cell division.

In FY 1987, work will be maintained on innovative bioreactor designs for biocatalyzed chemical production processes. These innovative approaches to carrying out biochemical reactions hold the promise of overcoming some of the problems which have prevented biochemical production processes from competing economically and energetically with conventional chemical processes. Some of these problems are: slow reaction rates, low yields, and low productivity of conventional batch fermenters. Already ECUT research on one concept has resulted in a potential 80-fold increase in bioreactor productivity over such conventional batch fermenters.

Tribology $2,400,000

The FY 1987 request for the ECUT Tribology Program (the multidiscipilinary science of friction, wear, and lubrication) is $2,400,000, a decrease of $1,355,000 from the FY 1986 appropriation.

The foundation for the long-range plan of the ECUT Tribology Program is a series of detailed analyses that determined energy losses due to a poor understanding of tribology in the transportation, industrial, residential, and utility sectors. Considering that approximately 72 quads of energy are used in the United States each year, these losses are quite sizeable: up to 0.15 quad could be saved in the aggregate in the mining, agriculture, foodprocessing, chemicals, pulp and paper, primary metals, and metalworking industries; up to 0.5 quad could be saved in the utility sector; and up to 2.8 quads could be saved in the transportation sector. While transportation obviously has the greatest losses, the generic nature of ECUT research permits considering automotive applications in the context of the temperatures at which a heat engine operates, and as a result, the needs of many industrial applications can be easily tied together with automotive research needs.

The major approach of this tribology research is to explore innovative lubrication concepts and novel surface modification techniques that mitigate friction and wear in present-day and advanced energy conversion and utilization devices. In this manner, it may be possible to effect major energy savings in the U.S. economy. What makes this program unique is that it is a directed basic research program: it spans the gap between the basic research funded by the DOE Office of Basic Energy Sciences and the engineering

development work funded by the Conservation and Fossil Energy offices. Cost-shared projects with these DOE offices are one means of developing and strengthening the technology base and transferring the technology to users. The major output of the ECUT Tribology Program is the development of standardized test procedures, data for the design of advanced mechanical systems, and state-of-the-art analytical equipment used to carry out cutting edge research on real world tribological systems.

Lubricants

ECUT tribology research answered the question in FY 1985 as to why various lubricating base stock oils perform differently with identical additive packages, an inconsistency in behavior that has hindered advancement in lubricating technology. The compounds in base stock oils that interact beneficially with the lubricant additives have now been identified, and that knowledge was transferred in late FY 1986 to the lubricant and additives industry by means of a workshop with researchers in those industries. This understanding opened up a whole new avenue in additive formulation chemistry because some of these base oil compounds can now be investigated as new additives for friction, wear, and oxidation control. As sources of crude oils that are suitable for base stock oil production become depleted, the results of this research will become even more important. Efforts in FY 1987 will build on this work, which dealt with low-temperature (up to 200^{o}C) liquid lubricants, and use it as a foundation for research on liquid lubricants for elevated (200^{o}-600^{o}C) temperatures. Liquid lubricants for the elevated temperature range are viewed by the tribology community as a major technological challenge and a limiting technology to advanced heat engines.

Efforts began in FY 1986 to carefully define the precise tribological conditions existing in machine elements, such as bearings, gears, and engine components, so that development of in-situ diagnostic techniques to study lubricant interaction could begin in FY 1987. This work is important because a better understanding of the lubricant conditions in actual working machine elements will enable designers to develop predictive models for lubricant failure and thereby avoid tribological problems in mechanical equipment.

In FY 1985 a final report on high-temperature (greater than 600^{o}C) lubrication needs for advanced heat engines was used to develop a comprehensive plan for this area of research. The main conclusion of the report was that the full potential of ceramic components for advanced heat engines cannot be realized unless associated tribological advances are made. The long-range plan, therefore, calls for developing new and/or improved laboratory scale tests capable of differentiating between high-temperature thermal-oxidative stability and deposition characteristics of individual basestocks, additives, and lubricants relative to the machine environment. By advancing the state-of-the-art, ECUT tribology research will enhance the likelihood of development of a low heat rejection, minimum friction engine. Close coordination and joint projects with the DOE/Office of Transportation Systems, the Department of Defense, and the National Aeronautics and Space Administration will continue in this area in FY 1987.

Mechanisms of Friction and Wear

Research funded by the ECUT Tribology Program over the past several years in the area of understanding the friction and wear characteristics of ceramics is now paying off. The DOE Office of Transportation Systems is using the technology base developed by ECUT to aid in determining which ceramics to use in advanced heat engines, and the new theory of wear of ceramics developed by ECUT has enabled that Office to understand better what happens under the actual operating conditions of such engines. Because the major problems seem to be solved, ECUT funding in FY 1987 will be used to complete contracts on the mechanisms of friction and wear of ceramics and to close out research in this area.

Friction and Wear Testing

Preparatory to beginning a new research thrust in FY 1986, a workshop was held in FY 1985 that was the first of its kind. The Workshop on Tribological Test Devices and Pro-

cedures for Ceramics brought together almost 100 scientists and engineers from 5 different countries. The consensus of the attendees was that the time had come to develop standardized friction and wear tests in order to ensure comparability of data. As a result of this workshop, international cooperation was enhanced in FY 1986 by the fact that ECUT researchers actively participated in a round robin series of friction and wear tests under the sponsorship of the European Economic Community. Again, the results of these tests will be used to determine how to develop standardized test procedures.

Also in FY 1986, the ECUT Tribology Program had coordinated with the American Society for Testing and Materials (ASTM), the American Society of Mechanical Engineers, and others to intitate a program in developing meaningful standardized friction and wear tests for ceramic materials. Test rigs and analytical equipment were used to develop tests that could be certified by standards and professional organizations. Plans for FY 1987 call for approval by ASTM of a standardized test and further development of standardized test procedures for materials other than ceramics, such as ceramic coatings.

Tribological Coatings

Increased energy savings and productivity can be gained by surface modification research for tribological applications because a treated surface can be made harder and more durable than an untreated material. The approach used by the ECUT Tribology Program has been to develop theoretical models of how a cutting tool chemically dissolves into the workpiece and then to conduct experiments to validate the models. So far, the research has been extremely successful because surface modification of conventional high-speed tool steels has brought about wear-resistant surfaces that are 10 times harder than commercially available surface-modified cutting tools. Costs to manufacture such tools are expected to be only about 20 percent more expensive for a 10-fold increase in tool life.

Plans for FY 1987 call for developing even more advanced coatings that are 50 times harder than the most advanced cutting tools, again with a modest increase in cost. The potential application is for bearings, cutting tools, gears, and farm machinery. One of the reasons for the success of this research has been the consortium of two universities, a national laboratory, and a cost-shared industry team that will enable technology transfer into the marketplace to be readily effected.

Results gained from tribological surface modification research in FY 1986 laid the foundation for a transportation-related thrust in FY 1987. Surface modification techniques will apply the theoretical tools developed in the cutting tool research to the more technically difficult area of the piston ring-cylinder liner interface in heat engines. This is an area where generic research from one field (industrial cutting tools) can be used in another (transportation). Another success from this research is the development of advanced characterization techniques that enable the surfaces to be exactly tailored to meet a specific need.

Tribological Design Tools

Several workshops were sponsored by private sector groups and foreign governments during FY 1985 to develop agendas for tribology research. The Canadian government, which recently started a program in tribology modeled after the DOE/ECUT program, feels strongly that an information system that includes tribological data would be invaluable to designers of mechanical components and systems. Further reinforcement for such a computerized data retrieval system was given by the Industrial Research Institute, an organization of over 200 directors of major industrial research laboratories. Among the top three items in their research agenda was again a data retrieval system.

It is apparent that there is a Government role here to serve as the expediter of technology transfer. A low-level effort to develop a draft project plan began late in FY 1985 and continued into FY 1986. The plan was developed by bringing information specialist together with tribologists from Canada and West Germany (where efforts had already begun). FY 1987 plans call for completing a review by industrial members and

gaining the financial support of the private sector, a whole host of professional societies (American Society of Mechanical Engineers, American Society of Lubrication Engineers, American Vacuum Society, America Ceramics Society, and many others) to cost share the development of a state-of-the-art computer system. Government sponsorship would last for 3 years after which time the system would be supported by the users.

An important design tool will be completed in FY 1987, a computer model that will assist U.S. engine designers in dealing with the problem of out-of-round cylinder bores. When the cylinder bore is not round, the piston rings cannot fit properly, and oil from the sump and combustion gases then mix. This problem contributes to the inability of the engine to reach theoretical efficiency. When the model is completed, it will become widely available for use in designing more efficient internal combustion engines.

International Research Monitoring $100,000

The FY 1987 request for International Research Monitoring is $100,000, a decrease of $40,000 from the FY 1986 appropriation.

The Multi-Sector Conservation Program is also responsible for evaluating and comparing the current status and projected directions of energy end-use and energy conversion technologies funded by foreign nations. This is an important responsibility. ECUT coordinates and integrates DOE foreign commitments through such mechanisms as the International Energy Agency (IEA) and bilateral activities for all of the Conservation Program. Results will aid considerably in guiding research in DOE Conservation efforts toward developing more fruitful and energy-efficient technologies that ensure future U.S. international competitiveness.

FY 1986 activities included the investigation of foreign technology resources apparent in Japan, West Germany, and Sweden. Specific technology information sources were identified, and abstracts were prepared and published in U.S. trade journals. After discussions with DOE Conservation program staff, priority research areas were identified,and the appropriate investigations were initiated. The FY 1987 program will continue with those investigations, albiet at a minimum level of effort.

Conservation Program Analysis and Planning $100,000

The Multi-Sector Conservation Program is taking on new responsibilities for the whole of the DOE Energy Conservation Program in FY 1987. The funding request is for $100,000. Responsibilities providing technical and administrative support for updating and revising the Five-Year Plan, assessing supercomputer needs, and recommending actions to ensure the availability of analytical instrumentation needed to conduct Conservation-related research. Finally, ECUT will provide oversight of research planned in various programs within the Office of Conservation. These funds and the work proposed will fill a gap in Energy Conservation Program coordination which has existed for several years.

In FY 1987 an assessment of the supercomputer needs for all the Conservation and Renewable Energy programs also will be conducted. As the sophistication of the research being carried out in a program increases, so too does the need for high-speed computations. Since one of the prime outputs of the ECUT program is experimentally validated predictive computer models, access to supercomputing capabilities is particularly acute in the ECUT program. Demand for supercomputer time is growing rapidly in the ECUT Combustion Technology, Materials-by-Design, Catalysis-by-Design, and Tribology Programs. However, other Conservation and Renewable Energy Programs, such as Solar Photovoltaics and Buildings and Community Systems, also have need for high-speed computers to simulate solar and building systems. The proposed assessment will identify and quantify to the extent possible the requirements which exist now for high-speed computing in all Conservation and Renewable Energy Programs and will project those needs into the future as the research in these programs progresses.

Energy-Related Inventions

The mission of the Energy-Related Inventions Program (ERIP) is to evaluate energy-related inventions and new concepts offered by the public and to provide assistance to the most promising.

Recent ERIP accomplishments include:

- Developed a commercial-scale process to manufacture aluminum fuel cylinders reinforced with glass filaments for use as automobile fuel tanks. Aluminum Corporation of America (ALCOA) subsequently purchased the development and presently markets the cylinders.

- Developed a process to ship fruits and vegetables without refrigeration in a natural atmosphere which allows them to ripen naturally and extends their shelf life. The initial test item of "Tom-AH-toes" was well received and is now being shipped to a number of East Coast retailers, including Safeway in the Washington, D.C., area.

Energy-Related Inventions Program.....$3,300,000

The FY 1987 request for the Energy-Related Inventions Program (ERIP) is $3,300,000, a decrease of $1,353,000 from the FY 1986 appropriation.

ERIP, initiated under the Federal Non-Nuclear Research and Development Act of 1974, provides first for evaluation of inventions by the Office of Energy-Related Inventions (OERI) in the National Bureau of Standards (NBS) of the Department of Commerce (DOC) and then, assistance by the DOE Energy-Related Inventions Program for inventions identified by OERI as promising. The program gives particular attention to small businesses and individual inventors by assisting the NBS-recommended inventors in developing and/or commercializing their inventions. ERIP was established to evaluate the technical merits of energy-related inventions submitted by individual inventors and small businesses and to provide financial and technical assistance to the most promising ideas. Through FY 1985 the National Bureau of Standards (NBS) had evaluated approximately 22,000 energy-saving inventions. Based on NBS recommendations, 224 inventors have been awarded grants totaling $16,100,000. Of these 224, 36 are in the marketplace with sales to date totaling over $155,000,000, and over 1,000 jobs have been created.

In FY 1986 2,000 invention proposals were evaluated with 35 to 40 private sector inventions being approved for further development. A funding level of $3.3 million in FY 1987 will reduce the number of inventions evaluated and support for inventors as well as eliminate continued support for the Innovative Concepts Program formerly funded by the ECUT Program.

National Appropriate Technology Assistance Service

The mission of the National Appropriate Technology Assistance Service (NATAS) is to provide information and consultation assistance to the public requesting self-help in solving energy problems.

NATAS accomplishments over the past year include:

- Responded to 10,184 nationwide requests for tailored information and technical assistance pertaining to engineering and scientific aspects of appropriate technologies and 639 requests for assistance pertaining to business planning, patents, licensing, and obtaining private sector financing for energy-related inventions and businesses.

National Appropriate Technology Assistance Service.....$750,000

The National Appropriate Technology Assistance Service (NATAS) FY 1987 Congressional request is $750,000, which is $646,000 less than the FY 1986 appropriation. This reflects a general, across-the-board reduction in NATAS activities.

The FY 1987 Congressional request provides for the continuation of some of the services provided by NATAS. NATAS currently provides tailored information responses and engineering, scientific, or technical aid to anyone in the United States who needs to know more about those technologies that lend themselves to self-help and provide solutions to individual energy problems. These "appropriate" technologies usually rely on sun, wind, and water resources and energy and natural resource conservation methods and devices.

The program is most beneficial to small businesses, farmers, homeowners, State and local governments, and nonprofit organizations. NATAS is working closely with existing Federal, State and local programs coordinating technical assistant activities.

In addition, NATAS provides commercialization assistance, i.e., business planning, development and financial analysis, to inventors and entrepreneurs who are attempting to develop and market products utilizing renewable energy sources or designed to conserve energy.

Capital Equipment $100,000

The FY 1987 request for plant and capital equipment is $100,000, a reduction of $830,000 from the FY 1986 appropriation. Funds will be used to continue limited upgrading of outmoded equipment and the acquisition of new state-of-the-art equipment for the ECUT Program at the DOE national laboratories and at Historically Black Colleges and Universities (HBCU's) conducting ECUT research.

Program Direction $500,000

Funding of $500,000 in FY 1987 will provide for 8 full-time equivalents (FTE's) to manage the research described above for the ECUT program, a reduction of 1 FTE from FY 1986.

MISSION AND OBJECTIVES OF STATE AND LOCAL ASSISTANCE PROGRAMS

The goal of the State and Local Assistance Programs is to encourage energy conservation initiatives on the State and local level through a mix of activities and programs, including direct financial assistance, personalized information services, technical assistance, and developmental demonstration projects to enhance State and private sector involvement in energy conservation. The Office of State and Local Assistance Programs administers the following programs in support of its goal:

- the Weatherization Assistance Program;
- the Schools and Hospitals Grants Program, also known as the Institutional Conservation Program;
- the Energy Policy and Conservation Act (EPCA) Grants, also known as the State Energy Conservation Program (SECP); and
- the Energy Extension Service.

The first two programs were established to provide assistance to sectors of the economy which experience particular difficulty in dealing with rising energy costs. The Weatherization Assistance Program increases the energy efficiency of residences occupied by low-income citizens across the country, particularly the homes of the elderly and the handicapped. The Schools and Hospitals Grants Program provides matching grants to non-profit institutions. The EPCA Grants and the Energy Extension Service were established to provide funding to the States and Territories for a variety of comprehensive energy conservation activities, and to build a capacity within and among the States and territories to plan, develop, and carry out their own energy conservation and outreach programs.

These programs have accomplished a great deal. Over 1.5 million low-income homes have been weatherized. Over 19,000 grants have been awarded to schools and hospitals, funding energy conservation projects in some 53,000 institutional buildings. Comprehensive energy conservation programs and information outreach programs are in place in 57 States and Territories, and through these millions of people have been aided in using energy more efficiently.

The FY 1987 budget request provides for the orderly closeout of these programs. Responsibility for providing these services most apropriately resides with the states. It is expected that funds will be made available to the states through the settlement of petroleum pricing violation cases, and these funds will help finance weatherization and other energy-related activities.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE
ENERGY CONSERVATION
State and Local Assistance Programs

Operating Expenses
(Tabular dollars in thousands. Narrative materials in whole dollars)

	FY 1985 Appropriation	FY 1986 Request	FY 1987 Base	FY 1987 Request	Request vs. Base
State & Local					
Weatherization	$191,113	$177,970	$177,970	$ ---	$-177,970
Schools & Hospitals	47,043	43,874	43,874	---	-43,874
EPCA Grants	23,522	17,499	17,499	---	-17,499
Energy Extension Service	9,801	7,297	7,297	---	-7,297
Program Evaluation	1,960	---	---	---	---
Program Direction	9,961	9,525	9,525	5,000	-4,525
Territories Assitance	---	465	465	---	-465
Total, SLAP	$283,400	$256,630	$256,630	$5,000	$-251,630
Staffing Total FTE's	178	180		100	-80 FTE

Authorizations:

National Energy Extension Service Act, Title V, P.L. 95-39;
Energy Policy and Conservation Grant Program (Energy Policy and Conservation Act, P.L. 94-163);
Energy Conservation and Production Grant Program (Energy Conservation and Production Act, P.L. 95-385);
Schools and Hospitals Grant Program (National Energy Conservation Policy Act, Sec. 301-304, P.L. 95-619);
Other Local Government Buildings Grant Program (National Energy Conservation Policy Act, Sec. 310-312, P.L. 95-619;
Weatherization Assistance Program Energy Conservation and Production Act, Sec. 411, P.L. 94-385);
Department of Energy Organization Act, P.L. 95-91;
P.L. 93-577, The Federal Non-nuclear Energy Research and Development Act of 1974
P.L. 95-91, Section 301, Department of Energy Organization Act

Department of Energy

FY 1987 Congressional Budget Request

Adjustments to FY 1985 Appropriations

	FY 1986 Conference	General Reduction	Management Initiatives	Pay Cost Restoration	Gramm-Rudman-Hollings Reduction	Adj. Approp. Total
State and Local						
Weatherization	$191,200	$-1,120	$-4,114	$ ---	$ -7,996	$177,970
School & Hospitals	47,134	-275	-1,014	---	-1,971	43,874
EPCA Grant	18,818	-129	-404	---	-786	17,499
Energy Extension Service	7,841	-47	-169	---	-328	7,297
Territories Assistance	500	-3	-11	---	-21	465
Program Direction	8,494	-51	-220	1,730	-428	9,525
Subtotal, State and Local	$273,987	$-1,625	$-5,932	$ 1,730	$-11,530	$256,630
General Reduction:						
Operating Expenses	-1,625	1,625	---	---	---	---
Management Initiatives:						
Operating Expenses	-5,932	---	5,932	---	---	---
Pay Restoration	1,730	---	---	-1,730	---	---
Total, State and Local	$268,160	$ ---	$ ---	$ ---	$-11,530	$256,630
Operating Expenses	268,160	---	---	---	-11,530	256,630
Capital Equipment						

Department of Energy

FY 1987 Congressional Budget Request

Adjustments to FY 1987 Appropriations

	FY 1986 Conference	General Reduction	Management Initiatives	Gramm-Rudman-Hollings Reduction	Approp. Total
Facilities					
Facilities	$ 10,319	$ -57	$ -222	$ -432	$ 9,608
General Reduction:					
Construction	-57	+57	---	---	---
Management Initiatives:					
Construction	-222	---	222	---	---
Total, Facilties	$ 10,040	$ ---	$ ---	$ ---	$ 9,608
Construction	$ 10,040	$ ---	$ ---	$ -432	$ 9,608

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF CHANGES
(In thousands of dollars)

State and Local Assistance Programs

FY 1986 Budget Request	$ 256,630
Program Increases and Decreases	
Weatherization Assistance Program - Close out of grant funding	$-177,970
Schools and Hospitals - Close out of grant funding	$ -43,874
EPCA Grants - Close out of grant funding	$ -17,499
Energy Extension Service - Close out of grant funding	$ -7,297
Territories Assistance - Close out of grant funding	$ -465
Program Direction - Supports 80 less FTE	$ -4,525
FY 1987 Budget Request	$ 5,000

ACCOMPLISHMENTS OF THE WEATHERIZATION ASSISTANCE PROGRAM

The Low-Income Weatherization Assistance Program increases the energy efficiency of residences occupied by low-income persons across the country, particularly the homes of the elderly and the handicapped. Since 1977, the program has weatherized over 1.5 million homes with an average home heating energy saving of 13% per home. Most recent specific accomplishments of the program are as follows:

o Revised the program rule to provide increased flexibility to States to develop energy audits and select the most cost effective weatherization techniques. The rule widens the range of weatherization materials which can be considered, and updates standards for them.

o Issued a rental unit weatherization policy to increase weatherization of such dwellings, especially in multi-family buildings.

o Implemented innovative financing projects in four states to demonstrate methods that can be used to increase private sector involvement in weatherizing multi-family structures. In Minnesota, the state is assisting a private landlord in securing the services of a commercial energy services firm. In Pennsylvania, the local community action agency is designing a loan interest reduction plan to accomplish energy conservation retrofit on a building. In New York, the local community action agency is establishing a separate operation as a not-for-profit energy services company to provide services to low-income multi-family buildings. In Michigan, the City of Ann Arbor is acting as a shared savings company, financing building projects from a revolving fund repaid by the savings from the energy conservation retrofits.

o Completed a national evaluation of the energy savings achieved in weatherized homes. As mentioned above, the evaluation shows an average home heating energy savings of 13% in those homes, with 23% of weatherized homes increasing energy use after weatherization.

o Implemented a comprehensive monitoring program to improve the overall quality of workmanship.

o Initiated comprehensive program evaluation activities to measure all impacts of the program.

ACCOMPLISHMENTS OF THE SCHOOLS AND HOSPITALS PROGRAM

The Schools and Hospitals Grants Program, also known as the Institutional Conservation Program (ICP), was established to encourage energy conservation in the institutional buildings sector. Such public and private non-profit institutions use significant amounts of energy, the cost of which represents a large proportion of their operating budgets. As a result, energy conservation measures can result in significant energy and economic savings. Most recent specific accomplishments of the program are as follows:

- From 1980-85, awarded 19,000 grants for energy conservation projects in over 53,000 buildings.

- Energy savings accumulating from ICP-funded projects are estimated to total 50 trillion BTU's per year.

- Energy costs for participating institutions have been reduced: $.54 for schools and $.65 for hospitals annually for every $1.00 invested by the federal government.

- A program data base which contains substantive energy-related data on institutional buildings (size, energy consumption rate, type of building).

- Developed an "Institutional Manager's Guide to Energy Conservation" which has been distributed to institutions, institutional organizations, state energy offices and DOE field offices.

- Developed, with the National Society of Professional Engineers, an " Institutional Managers Guide to Technical Assistance Analysis."

- Through a grant to the American Hospital Association, studied uses of alternate financing and developed guidelines for hospitals.

- Initiated a project to study use of and develop guidelines for alternate financing within communities so that such contracts might be used by the local government, public schools and colleges and universities within the same community.

- Participated in conferences, annual conventions and with energy committees of national professional associations and societies to multiply program efficiency and impact.

- Initiated in late 1984 a strategy development process to identify ways of compounding the impact of the ICP grant program by systematically incorporating more non-federal resources and expertise in institutional energy efficiency. Developed during 1985, through a process of broad-based research, analysis, coordination, and consultation, a strategy which addresses the three most important energy-related needs of institutions, (financing, expertise, and information) as identified during the course of interviews and focus group meetings. The strategy was approved by the Assistant Secretary for Conservation and Renewable Energy during September, 1985.

- ICP and several States are working on a variety of initiatives to encourage institutions which have applied for, but not received, ICP grants, to seek alternative, innovative sources of funding for energy efficiency improvements.

The following are examples of what grantees have accomplished with funds provided by ICP:

- ICP funds have supplemented Ohio State University's energy conservation efforts, which save the university approximately $5.5 million per year. University officials believe that without their energy conservation program tuition costs for each student would be about $100 per year higher. ICP has funded projects in 15 campus buildings since 1980.

- A Nevada high school installed the second of three evaporative coolers. The energy-efficient system, which saved over $28,000 in energy costs during its first year of operation, received a Special Award in the Department of Energy's 1985 technology-transfer competition, and was funded in part by an ICP grant.

- ICP funds have supplemented the Washington, D.C., Children's Hospital energy conservation efforts through the installation of pneumatic controls which are projected to save the hospital more than $100,000 per year.

- Cooper Green Hospital in Birmingham, Alabama, issued an ICP grant as seed money to leverage an additional $377,000 of private financing which, combined, saved 2-3 times the energy ICP dollars alone could have achieved.

ACCOMPLISHMENTS OF THE STATE ENERGY CONSERVATION PROGRAM

The State Energy Conservation Program (SECP) was created in 1977 to provide financial assistance to states for the purpose of supporting state and local conservation projects. The legislation authorizing the SECP requires that States carry out programs in five areas:

1. Mandatory lighting efficiency standards for public buildings (except public buildings owned or leased by the United States).

2. Programs to promote the availability and use of carpools, vanpools, a public transportation (except that no Federal funds provided under this part shall be used for subsidizing fares for public transportation).

3. Mandatory standards and policies relating to energy efficiency to govern the procurement practices of a state and its political subdivisions.

4. Mandatory thermal efficiency standards and insulation requirements for new and renovated buildings (except buildings owned or leased by the United States).

5. A traffic law or regulation which, to the maximum extent practicable consistent with safety, permits the operator of a motor vehicle to turn such vehicle right at a stop light after stopping.

o The South Dakota Housing Development Authority recently adopted the state's first Energy Conservation Code, for new and existing housing. The energy saving rules were developed by the South Dakota Energy Office.

o The state of Alaska has made available through the State Energy Conservation Program (SECP), 75 Energy Tellers which are used to measure, in dollars, the electrical consumption of plug-in type appliances or other electrical devices for 120-volt AC devices. They are offering Energy Tellers to all electrical utilities in the state for their customers' use. Requests for 42 of the Tellers have been received from utilities.

o The Florida Energy Office assisted the legislature in its 1985 regular session by addressing energy conservation in three key bills. Passed during the session were: (1) One bill encourages state agencies to consider "shared savings financing" for energy conservation retrofits and maintenance services provided by private firms. The firms would own any purchased equipment for the duration of the contract, not to exceed 10 years, and would be recompensed out of the savings. (2) New legislation also requires a life-cycle cost analysis on high energy-use replacement equipment for buildings owned or leased by the state. In the past, such equipment as air conditioners, heaters, and water heaters were chosen on the basis of lowest bid. (3) Ridesharing is promoted by a bill that provides reserved parking spaces free for state employee car pools.

o The North Dakota Office of Intergovernmental Assistance has established a computer program which analyzes costs and potential savings in street lighting systems for smaller communities. The program is contained on three diskettes designed to run an IBM-PC. It determines current operating costs, computes potential costs, savings of converting to high pressure sodium lights, and computes potential savings from reducing the hours of operation.

o The District of Columbia Energy Office sponsored a series of energy conservation workshops under the auspices of the SECP which focused on a variety of different sectors within the city. Workshops have been conducted for operations of the Blue Plains Wastewater Treatment Plant and for building design professionals (architects and engineers). Additional workshops include training sessions for owners, operations, and managers of commercial office buildings and an advanced course for building design professionals.

ACCOMPLISHMENTS OF THE ENERGY EXTENSION SERVICE

The Energy Extension Service (EES) was established to connect energy users - such as homeowners, tenants, landlords, small business and local governments with practical conservation and renewable resources options available to them. The EES was modeled after the highly successful Agricultural Cooperative Extension Service. Grants are given to States to implement EES programs and to deliver services to their energy users. States are given broad flexibility in designing programs to meet their particular needs. The service as established will provide the national infrastructure for the transfer of new technologies as they become available. Examples of types of programs that States are running are:

o The Youth Energy Conservation Corps (YECC) is a program element of the West Virginia Energy Extension Service. The goals of the program are: (1) to elicit an increased response rate to the Residential Conservation Service energy audit program and (2) provide youths with part-time employment to develop job skills. The West Virginia 4-H program was selected as the organization to operate the program in cooperation with the West Virginia University Center for Extension and Continuing Education. During the first program year, 1,219 audits were conducted by 700 youths in seven counties. Ninety-five percent of the households participating had never previously participated in an energy audit. Fifty-nine percent initiated at least one of the recommended measures. Overall, 78 percent of all participating households felt the audit program useful and 65 percent felt that changes in their lifestyles were made as a result of the audit.

o The Alabama Energy Extension Office has developed the "Car Kit" which consists of eight Apple computer programs on three diskettes, five color video programs (for a total of 27 minutes) on 1/2" VHS cassetts tape, car owner's handbook and a teacher's guide. The Car Kits distributed free of charge to the first 100 schools in Alabama requesting them, will then be available for a nominal fee. Developed for driver education classes, libraries or general classroom use, the Car Kits can be used to teach students about computers while at the same time offering relevent material concering car operation, maintenance, and energy conservation. The Car Fitness Book is a reference guide to car maintenance and energy efficiency conveniently sized to fit the car's glove compartment. It provides practical information on driving techniques, car maintenance, and energy conservation. The transportation videos consist of a series of five videos on one 1/2" VHS tape. They deal with safe driving practices, car care, and saving energy. The transportation conservation microcomputer software consists of a series of eight programs on three disks.

o Massachusetts Energy Office Energy Extension Service has recently begun the second phase of its Energy Employment Training Program. This program's goal is to increase employment opportunities for low-income, urban, and minority heads of household through employment training in an energy-related industry. A grantee of the State Energy Office in the city of Boston is currently recruiting eligible individuals to train as entry-level heating, ventilation, and air conditioning technicians. Once recruited, the individuals will be trained and placed in appropriate jobs. It is the hopes of the Massachusetts Energy Office that once this phase of the program is completed, the Energy Employment Training Program will be replicated in another part of Massachusetts.

Department of Energy
FY 1987 CONGRESSIONAL BUDGET REQUEST
State and Local Assistance Programs

NARRATIVE JUSTIFICATION

The goal of the State and Local Assistance Program is to encourage energy conservation initiatives at the State and local level through a mix of activities and programs, including direct financial assistance, technical assistance, and developmental/demonstration projects to enhance State/private sector involvement in energy conservation. In FY 1987, program efforts will be directed toward the orderly close-out of the State Energy Conservation (EPCA), Energy Extension Service, Schools and Hospitals and Weatherization Assistance Programs. Responsibility for providing these services most appropriately resides with the States. It is expected that funds will be made available to the States through settlement of petroleum pricing violation cases, and these funds will help finance weatherization and other energy-related activities.

Weatherization	FY 1985	FY 1986	Congressional Request FY 1987
	$191,113,000	$177,970,000	-0-

The FY 1987 Budget request provides no funding for Weatherization. This represents a $177.9 million decrease from FY 1986.

The Weatherization Assistance Program increases the energy efficiency of residences occupied by low-income citizens across the country, particularly the homes of the elderly and the handicapped.

It is estimated that approximately 14.4 million households at or below 125% of poverty are eligible to receive assistance under this program. Low-income households are least able to respond effectively to the market signal of higher prices by making energy conservation investments. As of December, 1985, approximately 1.5 million low-income homes were weatherized under this program.

Because over half of the eligible population lives in rental and multifamily units, increased emphasis has been placed on weatherizing these dwellings. To assist in increasing the impact on the low-income multifamily building sector, several innovative financing demonstrations have been undertaken to explore options available to State and local program operators, landlords, and private sector financial institutions.

Also, the program has taken the initiative in identifying and developing alternative approaches to providing weatherization services to the low-income. During the last half of FY 85 and through FY 86, the program is:

- promoting quality workmanship at the local level through quality control systems established by the States;
- ensuring program efficiency through site monitoring visits;
- conducting program evaluation activities to determine the best approaches to maximizing weatherization resources;
- conducting national and regional conferences to share program information, state-of-the-art weatherization techniques and management strategies; and
- developing and implementing a program to provide program opportunity grants to States and local agencies to promote energy related business development activities by local agencies.

Amendments to the program regulations have given the States more flexibility and responsibility in operating their respective programs. This will allow the State and local agencies to respond best to local needs.

In FY 1986, the program will examine what services should be provided and how best to provide those services given limited Federal funding. This examination will result in the development of a multi-year strategy aimed at broadening and diversifying the weatherization resource base in order to accomplish program goals.

In FY 1987, DOE will continue limited work with States and local agencies to encourage innovative financing of low-income weatherization activities, while closing down the financial assistance aspects of the program.

Schools & Hospitals	FY 1985	FY 1986	Congressional Request FY 1987
	$47,043,000	$43,874,000	-0-

The FY 1987 budget request provides no funding for the Schools and Hospitals Grant Program. This represents a $43.8 million decrease from FY 1986.

The Schools and Hospitals Grant Program was established to encourage energy conservation initiatives in the institutional building sector. Such public and private non-profit institutions use significant amounts of energy, the cost of which represents a large proportion of their operating budgets. As a result, energy conservation measures can result in significant energy and economic savings.

Through FY 1985, the program awarded 19,000 grants for energy conservation projects in over 53,000 school and hospital buildings. The program has also had notable secondary effects in stimulating energy-saving activities and developing expertise in energy conservation in participating institutions.

The program has taken the initiative in identifying and developing alternative approaches to promoting energy conservation in the institutional building sector. During 1985, through a process of broad-based research, analysis, coordination and consultation, a multi-year program strategy was developed to address the three most important energy-related needs of institutions, (financing, expertise, and information) as identified during the course of interviews and focus group sessions. In FY 1986, the program will implement its multi-year strategy to:

- continue demonstrating various alternative energy conservation financing methods to increase private sector support of energy conservation in institutions;

- conduct enhanced information development networking activities and demonstration projects in partnership with national associations, state and local governments, and other Federal programs which will focus on providing products and services such as energy management and financing case studies, data on successful energy efficiency programs and projects, and to provide data and referrals to assist institutions with energy management and financing concerns.

Also, as part of it's strategy implementation, ICP will use a portion of the appropriation for developmental grants to provide seed money for states to assist their non-profit institutions to access alternative sources of financing energy conservation and share energy management information and expertise.

In FY 1987, DOE will continue limited work with States to encourage innovative financing of priority projects and to share energy management information and expertise with institutions while closing down the financial assistance aspects of the program.

EPCA Grants	FY 1985	FY 1986	Congressional Request FY 1987
	$23,522,000	$17,499,000	-0-

The FY 1987 budget request does not provide funding for the EPCA grants. This represents an $17.4 million reduction from FY 1986.

SECP has provided states with the means to plan, establish and implement energy conservation programs that reduce energy consumption in each state. Fifty states and seven territories have developed energy efficiency plans, and are implementing and evaluating specific programs.

SECP has supported the states in the development of conservation and renewable resources activities that address the specific energy issues of each state. The states have also developed and are maintaining an energy emergency planning and response network, a database of information on energy use and energy conservation efforts statewide, and state-wide "networks" of organizations involved in energy activities.

In FY 1985 DOE focused on ways to help the states increase their involvement in the planning and financing of their energy programs. In FY 1986, DOE will work extensively with states to increase their program planning, evaluation, and financing skills, and to seek out and encourage private sector investment in energy efficiency activities.

In FY 1987 DOE staff will continue to work in a limited fashion with the states providing training and technical assistance. However, no financial support will be provided to enable the states to develop and implement plans for obtaining increased private sector funding, since the grants aspect of the program terminates this year.

Energy Extension Service	FY 1985	FY 1986	Congressional Request FY 1987
	$9,801,000	$7,297,000	-0-

The FY 1987 budget request provides no funding for the Energy Extension Service (EES). This represents a $7.3 million reduction from FY 1986.

Through the States EES has provided tailored information, and technical assistance to small scale energy users (i.e small businesses, local governments and homeowners) to help them decide what are their most effective and productive energy conservation and renewable energy options.

The demonstration of commercially available technologies/techniques, hands-on workshops, on-site technical assistance and "how-to" workbooks are the principal methods utilized by EES to meet the needs of the energy consumer. EES has functioned as an integrating and coordinating mechanism for existing resources and delivery mechanisms, providing them with new/updated information and backing them with sound technical advice. EES has also provided a referral service to assist energy consumers.

In FY 1985, DOE focused on ways to help the states increase their involvement in the planning and financing of their energy programs. In FY 1986, DOE will work extensively with states to increase their program planning, evaluation, and financing skills, and to encourage private sector investment in energy efficiency activities, as well as the networking of technical resources to support their programs.

In FY 1987 DOE will continue to work, in a limited fashion, with the states providing training and technical assistance. However, no financial support will be provided to states to develop and implement plans on obtaining increased private sector involvement, since the grants aspect of the program terminates this year.

Territories Assistance	FY 1985	FY 1986	Congressional Request FY 1987
	$ -0-	$465,000	$ -0-

The FY 1987 budget request provides no funding for Territories Assistance. This represents a $465,000 decrease from FY 1986.

In FY 1986, DOE will provide small grants to the Territories to aid them in developing their idigenous energy resources, as an alternative to conventional energy sources which must be imported to the islands.

There are no funds requested for this activity in FY 1987.

Program Direction	FY 1985	FY 1986	Congressional Request FY 1987
	$9,961,000	$9,525,000	$5,000,000

The FY 1987 budget request for Program Direction is $5 million, a reduction of $4.5 million from FY 1986.

The staffing level for program direction in FY 1987 is 100 FTE. This FTE request will support personnel in headquarters and in DOE's field offices to provide for orderly closeout of the financial aspects of these programs.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE
POLICY AND MANAGEMENT
Energy Conservation - Operating Expenses
(Tabular dollars in thousands. Narrative material in whole dollars.)

	FY 1985 Approp.	FY 1986 Adj. Approp.	FY 1987 Base	FY 1987 Request	Request vs. Base
Energy Conservation					
Policy and Management Operating Expenses	$ 1,747	$ 1,687	$ 1,687	$ 1,792	+105
Total Policy and Management	$ 1,747	$ 1,687	$ 1,687	$ 1,792	+105
Staffing Total FTEs	28	21	21	17	- 4

Authorization: Section 209 P.L. 95-91, "Department of Energy Organization Act."

Department of Energy

FY 1987 Congressional Budget Request

Adjustments to FY 1986 Appropriations

	FY 1986 Conference	General Reduction	Management Initiatives	Pay Cost Restoration	Gramm-Rudman-Hollings Reduction	Adj. Approp. Total
Policy & Management - CE (EC)						
Policy & Management	$ 1,300	$ -8	$ -39	$ 510	$ -76	$1,687
General Reduction	-8	+8	---	---	---	---
Management Initiatives	-39	---	39	---	---	---
Pay Restoration	+510			-510	---	---
Total, Policy & Management	$ 1,763	$ ---	$ ---	$ ---	$ -76	$1,687

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF CHANGES
POLICY AND MANAGEMENT
(In Thousands of Dollars)

FY 1986 Adjusted Appropriation	$1,687
Increased level of support	+105
FY 1987 Congressional Request	$1,792

Policy and Management.....$1,792,000

The Policy and Management FY 1987 Congressional Request is $1,792,000 and 17 full time equivalent staff years of effort which provides for overall management guidance to Conservation and Renewable Energy (CE) programs. Staffing levels provide the executive and overall program direction for all CE programs to ensure effective management. These activities include executive management, policy formulation, program review and approval, and liaison with senior officials in DOE, White House, Congressional, OMB, other Departmental Agencies, private industry, and State and local governments. In addition, the staff will carry out analyses of the CE programs needed to assess performance and effectiveness.

The FY 1987 request also provides for a minimal level of support for functions such as planning, policy development and analysis, program planning and evaluation, budget preparation and execution, program and personnel management and administrative support. Activities performed include development of planning guidance, analysis of program options for achieving planned objectives, evaluation of performance against program objectives, handling and/or coordination of program/budget submissions and execution of approved budgets and ongoing support functions in the areas of: administrative services, procurement, personnel, space management and related support services including a comprehensive program review function. In addition, funds are included for the continuation of a procurement tracking system and an automated support system which provides text processing, electronic mail, data base management, communication and other program applications.

Strategic Petroleum Reserve

DEPARTMENT OF ENERGY

FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST

STRATEGIC PETROLEUM RESERVE

VOLUME 7

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DEPARTMENT OF ENERGY

Proposed Appropriation Language

Strategic Petroleum Reserve

[For expenses necessary to carry out the provisions of sections 151 through 166 of the Energy Policy and Conservation Act of 1975 (Public Law 94-163), $113,043,000 to remain available until expended.] (Department of the Interior and Related Agencies Appropriations Act, 1986, as included in Public Law 99-190.)

DEPARTMENT OF ENERGY

Proposed Appropriation Language

[SPR Petroleum Account]

[Notwithstanding any other provision of law, the Secretary of Agriculture, at the request of the Secretary of Energy, may exchange agricultural products owned by the Commodity Credit Corporation for crude oil to be delivered to the Strategic Petroleum Reserve: Provided, That the Secretary of Energy shall approve the quantity, quality, delivery method, scheduling market value and other aspects of the exchange of such agricultural products: Provided further, That if the volume of agricultural products to be exchanged has a value in excess of the market value of the crude oil acquired by such exchange, then the Secretary of Agriculture shall require as part of the terms and conditions of the exchange that the party or entity providing such crude oil shall agree to purchase, within six months following the exchange, current crop commodities or value-added food products from United States producers or processors in an amount equal to at least one-half the difference between the value of the commodities received in exchange and the market value of the crude oil acquired for the Strategic Petroleum Reserve.] (Department of the Interior and Related Agencies Appropriations Act, 1986, as included in Public Law 99-190.)

DEPARTMENT OF ENERGY

FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF ESTIMATES BY APPROPRIATION BY MAJOR ACTIVITY

STRATEGIC PETROLEUM RESERVE

(Budget Authority in Thousands of Dollars)

	FY 1985 Actual	FY 1986 Estimate	FY 1987 Request
Strategic Petroleum Reserve	$2,307,857	$ 378,217	$ 149,966
Less Use of Prior Year Balances	-258,307	-270,684	-149,966
Total, Strategic Petroleum Reserve .	$2,049,550	$ 107,533	$ ---

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
AMOUNTS AVAILABLE FOR OBLIGATION
STRATEGIC PETROLEUM RESERVE
(in thousands of dollars)

	FY 1986	FY 1987
Appropriation, Strategic Petroleum Reserve	$ 107,533 [1/]	$ ---
Appropriation, SPR Petroleum Account	---	---
Subtotal, Budget Authority	$ 107,533	$ ---
Unobligated Balances, Start of Year	1,004,165	747,576 [2/]
Unobligated Balances, End of Year	- 747,576 [2/]	- 597,632
Total, Obligations	$ 364,122	$ 149,944

1/ Net of proposed sequestration.

2/ Does not include $27,949,000 of FY 1986 receipts from SPR test sale.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
STRATEGIC PETROLEUM RESERVE
SUMMARY OF RESOURCES AND OBLIGATION PLANS
FY 1986 AND FY 1987
(dollars in thousands)

	Unobligated Balances 10/1/85	FY 1986 Appropriation	Use of Prior Year Balances	Total Available Resources	Planned Obligations FY 1986	Unobligated Balances 10/1/86	Proposed Reprogramming for FY 1987	Subtotal	Planned Obligations FY 1987	Unobligated Balances 10/1/87
Strategic Petroleum Reserve Account										
Storage Facilities Development and Operations										
Phase I	$ 916	$ ---	$- 916	$ ---	$ ---	$ ---	$ ---	$ ---	$ ---	$ ---
Phase II	19,405	---	- 9,965	9,440	9,440	---	---	---	---	---
Phase III	231,289	156,414	- 226,508	161,195	4,504	156,691	-156,691	---	---	---
Non-Phase Specific	38,498	206,140 2/	- 18,186	226,452 4/	187,184	39,268	+145,300	184,568	136,521	48,047
Subtotal	$ 290,108	$ 362,554	$- 255,575	$ 397,087	$ 201,128	$ 195,959	$- 11,391	$ 184,568	$ 136,521	$ 48,047
Management	4,014	15,663 3/	- 2,145	17,532	15,500	2,032	+ 11,391	13,423	13,423	---
Petroleum Acquisition and Transportation	12,964	---	- 12,964	---	---	---	---	---	---	---
Total Strategic Petroleum Reserve Account	$ 307,086	$ 378,217	$- 270,684	$ 414,619	$ 216,628	$ 197,991	$ ---	$ 197,991	$ 149,944	$ 48,047
SPR Petroleum Account 1/	697,079	---	---	697,079	147,494	549,585	---	549,585	---	549,585
Total SPR Program	$1,004,165	$ 378,217	$- 270,684	$1,111,698	$ 364,122	$ 747,576	$ ---	$ 747,576	$ 149,944	$ 597,632

1/ Amounts exclude $27,949,000 received in FY 1986 from the SPR test sale. Upon deposit in the SPR Petroleum Account these funds became available for obligation but will be deferred.

2/ Net of $4,225,000 proposed for sequester pursuant to the Balanced Budget and Emergency Deficit Control Act of 1985 (P.L. 99-177).

3/ Net of $607,000 proposed for sequester pursuant to the Balanced Budget and Emergency Deficit Control Act of 1985 (P.L. 99-177).

4/ Includes $50,000 proposed for set-aside in FY 1986 under Section 515 of the Treasury-Postal Service-General Government Appropriation Act, 1986, enacted by reference in the FY 1986 Continuing Appropriations Act (P.L. 99-190).

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
PROGRAM OVERVIEW

STRATEGIC PETROLEUM RESERVE

BACKGROUND

The Strategic Petroleum Reserve (SPR) was created by the Energy Policy and Conservation Act (P.L. 94-163), signed into law on December 22, 1975. The objective of the SPR program is to reduce the vulnerability of the United States to a severe petroleum supply disruption.

The SPR provides protection to the United States from oil supply disruptions by supplementing oil supplies, mitigating the upward pressure on world prices and thus reducing the potential loss in economic output. It can also provide time and flexibility to the President in attempting to resolve an oil supply disruption.

Developments in 1985 regarding the SPR program include the following:

(1) On January 9, 1985, the Congress approved a reprogramming, from Phase III to Non-Phase Specific, of $42,334,000 for a portion of the Distribution Enhancements proposed in the Department's October 1984 reprogramming request.

(2) On February 4, 1985, the FY 1986 Budget was presented to the Congress, providing for:

(a) An indefinite moratorium on SPR storage capacity development and oil fill at the end of FY 1985;

(b) Placing the SPR in a state of standby readiness for drawdown;

(c) Continuance of that portion of the Distribution Enhancements program approved by the Congress on January 9, 1985;

(d) Deferral from FY 1985 to FY 1986 of $270,738,000 and $827,028,000, respectively, of funds already appropriated for the Strategic Petroleum Reserve Account and the SPR Petroleum Account; and

(e) All Facilities Development and Operations funding to be classified as Non-Phase Specific after FY 1985.

(3) On February 14, 1985, the Director of the Office of Management and Budget (OMB) requested that the Department submit a transition plan by April 30, 1985, to place the SPR in a state of standby readiness. The plan was submitted to OMB on April 29, 1985, and subsequently also to the Congress on May 23, 1985.

(4) On July 2, 1985, the Energy Policy and Conservation Amendments Act of 1985 (P.L. 99-58) was enacted, extending SPR program authorities to June 30, 1989. This legislation also established a requirement for a test drawdown and distribution of SPR oil through the sale or exchange of approximately 1.1 million barrels (MMB) of crude oil in storage at the Reserve. It also established the requirement for this test to commence within 180 days of the enactment date unless the President determined that implementation of the SPR Distribution Plan was required because of a severe energy supply interruption, or because of obligations of the United States under the International Energy Program.

(5) On August 15, 1985, the President signed the FY 1985 Supplemental Appropriations Act, (P.L. 99-88) containing the following provisions regarding the SPR:

(a) Restored all deferred Strategic Petroleum Reserve Account funds and $290,070,000 of the deferred SPR Petroleum Account funds;

(b) Directs the continued development of facilities for a 750 MMB system during FY 1986; and

(c) Requires that the SPR oil inventory be increased to 500 MMB by the end of FY 1986.

House Report 99-142 accompanying this Act added a requirement for a report to the Congress on the alternatives and recommendations for increasing the distribution capability of the SPR above 4 MMB per day for a completed 750 MMB storage program.

(6) On September 30, 1985, the inventory of crude oil in storage at the SPR reached 489.3 MMB, representing a daily average fill rate of 159 thousand barrels during FY 1985.

(7) On November 18, 1985, the test sale of SPR oil required by the Energy Policy and Conservation Amendments Act of 1985 commenced with the issuance of a Notice of Sale to seventy-two potential offerors. Seventeen offers for a total of 7.17 MMB were received on November 25, 1985 and, during the week of December 2, 1985, five contracts for a total of 1.0 MMB of sweet and sour crudes were awarded at an average price of approximately $28.88 per barrel. Deliveries under these contracts commenced on December 11, 1985 and were completed in mid-January 1986. Total deliveries amounted to 966,809 barrels at an average price of approximately $28.91.

(8) On December 19, 1985, the President signed the FY 1986 Continuing Appropriations Act (P.L. 99-190) which provided approximately $112.4 million in new budget authority for the SPR in FY 1986 for activities necessary to continue with development of a 750 MMB system. Additionally, the Act permits the Secretary of Energy to exchange surplus U. S. Government-owned agricultural commodities for crude oil to fill the Reserve.

Proposed FY 1987 Budget

The FY 1987 budget proposes an indefinite moratorium on the further development of the SPR, effective at the end of calendar year 1985. Oil fill will continue in FY 1986 until the SPR inventory reaches a level of 500 MMB less SPR test sale deliveries, as required by current law. The Administration will propose the elimination of the legislative requirement concerning further SPR fill and linkages to Naval Petroleum Reserve production and sales. No fill is planned in FY 1987.

During the last nine months of FY 1986, activity at SPR development sites will focus primarily on completing ongoing construction and on the performance of tasks necessary to accomplish the transition of the sites to a standby mode, ready for drawdown or restart of development if changes in oil market conditions so warrant. In FY 1987, the focus will be on maintaining the sites in this standby-readiness mode. Work will continue in both FY 1986 and FY 1987 on distribution enhancements that are necessary to permit the drawdown and distribution of the SPR inventory at a rate of approximately 3.1 million barrels per day.

There is no requirement for new budget authority in FY 1987 since unobligated balances of funds appropriated in prior years are sufficient to sustain activities essential for maintaining SPR facilities in a standby-readiness state. The proposed allocation of resources for this purpose is as follows:

(1) The unobligated balance of funds available in the Strategic Petroleum Reserve Account on October 1, 1985, including the balance in the account from the FY 1981 appropriation for Petroleum Acquisition and Transportation, and the funds appropriated to the account for FY 1986 will be treated in the following manner:

	($000)
Total funds available October 1, 1985	$ 307,086
FY 1986 appropriations	112,365
Proposed for sequester	- 4,832
Proposed Section 515 set-aside	- 50
Planned FY 1986 Obligations	- 216,628
Balance deferred for use after FY 1986	$ 197,941

(2) To reflect the conversion to and maintenance of SPR facilities in a standby readiness condition after December 1985, Phase III funds that will not be obligated in FY 1986 are being proposed for reprogramming to the Non-Phase Specific and Management budget categories.

(3) Because of the moratorium on capacity development and completion of oil fill, Federal staffing requirements are reduced. Accordingly, it also is proposed that the staffing of the SPR be reduced from 178 full-time equivalents (FTE's) in FY 1985 to 152 FTE's in FY 1986, and to 120 FTE's in FY 1987.

(4) Funds in SPR Petroleum Account on October 1, 1985, and the proceeds deposited in the account from the SPR test sale will be treated as follows:

	($000)
Total funds available October 1, 1985	$ 697,079
Proceeds from test sale	27,949
Total available in FY 1986	$ 725,028
Planned obligations for 500 MMB fill	- 147,494
Balance deferred	$ 577,534

At present, the May 1985 Transition Plan for moving the SPR to a standby readiness condition by the end of FY 1985 is being revised to reflect changes in transition resource requirements that are a result of the resumption of facilities development following the August 15, 1985 enactment of the FY 1985 Supplemental. Upon completion of this effort, the need for adjustments to current estimates of FY 1986 and FY 1987 resource requirements will be considered as necessary.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF ESTIMATES BY APPROPRIATION BY MAJOR ACTIVITY
STRATEGIC PETROLEUM RESERVE
(In thousands of dollars)

	FY 1985 Actual		FY 1986 Estimates 4/		FY 1987 Request	
	BA	BO	BA	BO	BA	BO
Strategic Petroleum Reserve Account						
Storage Facilities Development and Operations:						
Phase I	$ ---	$ 180	$ ---	$ 488	$ ---	$ 1,000
Phase II	46,399	44,877	---	27,230	---	8,030
Phase III	281,295	75,410	156,414	49,927	---	4,206
Non-Phase Specific	113,606	72,586	206,140 5/	155,922	136,521	208,502
Subtotal	441,300	193,053	362,554	233,567	136,521	221,738
Petroleum Acquisition and Transportation	---	---	---	---	---	---
Management 1/	17,890	19,414	15,663	17,004	13,423	15,348
Subtotal	459,190	212,467	378,217	250,571	149,944	237,086
Use of Prior Year Balances	---	---	- 270,684	---	- 149,944	---
Total Strategic Petroleum Reserve Account	$ 459,190 2/	$ 212,467	$ 107,533	$ 250,571	$ ---	$ 237,086
SPR Petroleum Account	2,049,550 3/	1,620,728	---	389,290	---	---
Total SPR Program	$2,508,740	$1,833,195	$ 107,533	$ 639,861	$ ---	$ 237,086

1/ New budget category in FY 1987; replaces Planning and Management Support and Program Direction.

2/ FY 1985 appropriation for Strategic Petroleum Reserve Account as enacted in the FY 1984 Second Supplemental.

3/ $536,958,000 deferred in FY 1985; $549,585,000 plus test sale receipts of $27,949,000 proposed for deferral in FY 1986.

4/ Net of $4,832,000 proposed for sequester pursuant to the Balanced Budget and Emergency Deficit Control Act of 1985 (P.L. 99-177).

5/ Includes $50,000 proposed for set-aside in FY 1986 under the Treasury-Postal Service-General Government Appropriations Act, 1986, enacted by reference in the FY 1986 Continuing Appropriations Act (P.L. 99-190).

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE
STRATEGIC PETROLEUM RESERVE
(Tabular dollars in thousands. Narrative material in whole dollars)

	FY 1985 Appropriation	FY 1986 Appropriation 4/	FY 1987 Base	FY 1987 Request	Request vs. Base
Strategic Petroleum Reserve Account					
Storage Facilities					
Development and Operations					
Phase I	$ ---	$ ---	$ ---	$ ---	$ ---
Phase II	46,399	---	---	---	---
Phase III	281,295	156,414	156,414	---	- 156,414
Non-phase Specific	113,606	206,140 5/	206,140	136,521	- 69,619
Subtotal	441,300	362,554	362,554	136,521	- 226,033
Petroleum Acquisition and Transportation	---	---	---	---	---
Management 1/	17,890	15,663	15,663	13,423	- 2,240
Subtotal	459,190	378,217	378,217	149,944	- 228,273
Use of Prior Year Balances	---	- 270,684	- 270,684	- 149,944	+ 120,740
Total Strategic Petroleum Reserve Account	$ 459,190 2/	$ 107,533	$ 107,533	$ ---	$- 107,533
SPR Petroleum Account	2,049,550 3/	---	---	---	---
Total SPR Program	$2,508,740	$ 107,533	$ 107,533	$ ---	$- 107,533
Staffing - Total FTE's	178	152	152	120	- 32

Authorization: Section 157-167, P.L. 94-163

1/ New budget category in FY 1987; replaces Planning and Management Support and Program Direction.
2/ FY 1985 Appropriation for Strategic Petroleum Reserve Account as enacted in the FY 1984 Second Supplemental.
3/ $536,958,000 deferred in FY 1985; $549,585,000 plus test sale receipts of $27,949,000 proposed for deferral in FY 1986.
4/ Adjustments to the FY 1986 Appropriation are shown in the table on the following page.
5/ Includes $50,000 proposed for set-aside in FY 1986 under the Treasury-Postal Service-General Government Appropriation Act, 1986 enacted by reference in the FY 1986 Continuing Appropriations Act (P.L. 99-190).

Department of Energy

FY 1987 Congressional Budget Request

Adjustments to FY 1986 Appropriations

	FY 1986 Conference	General Reduction	G-R-H Reduction	Total
Strategic Petroleum Reserve (SPR)				
Planning and Management Support	$ 4,552	$ -8	$ -189	$ 4,355
Storage Facilities Development and Operations				
Phase I	--	--		
Phase II	--	--	-	-
Phase III	156,691	-277	-	156,414
Non-Phase Specific	210,737	-372	-4,225	206,140
Program Direction	11,747	- 21	-418	11,308
Subtotal, SPR	$ 383,727	$-678	$-4,832	$ 378,217
General Reduction	-678	678	-	-
Use of Prior Year Balances (SPR)	-270,684	-	-	-270,684
Total, Strategic Petroleum Reserve	$ 112,365	-	$-4,832	$ 107,533
Operating	112,365	-	-4,832	107,533

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF CHANGES
STRATEGIC PETROLEUM RESERVE
(in thousands of dollars)

FY 1986 appropriation	$ 107,533
Storage Facilities Development and Operations	
o Phase III	
- Decrease due to Phase III construction being fully funded in prior years	- 156,414
o Non Phase Specific	
- Decrease due to transition of facilities to standby operations mode	- 18,891
- Decrease due to reduced requirements for Capital Improvements Program	- 676
- Decrease due to near completion in FY 1986 of moratorium program for Distribution Enhancements	- 50,052
Management	
o Personnel Compensation and Benefits	
- Increase due to restoration of proposed FY 1986 reduction in Federal salaries	+ 263
- Effect of moratorium of Federal staffing levels	- 881
o Travel	
- Effect of moratorium on staff travel	- 95
o Other Services	
- Decrease due to transfer of non-management support services funding to Non-Phase Specific	- 1,000
- Effect of moratorium on management support services requirements	- 527
Subtotal	$ 120,740
Use of prior year balances	- 120,740
FY 1987 budget request	$ ---

(tabular dollars in thousands; narrative material in whole dollars)

	FY 1986 Obligations	FY 1987 Base	FY 1987 Request
STORAGE FACILITIES DEVELOPMENT AND OPERATIONS	$ 201,128	$ 362,554	$ 136,521

The FY 1987 Request for Storage Facilities Development and Operations represents a decrease of $64,607,000 from the FY 1986 obligations plan due to the proposed moratorium on facilities development, beginning in January 1986. For FY 1986, this moratorium policy is reflected in the proposed deferral of $195,909,000 of the funds appropriated for Storage Facilities Development and Operations.

Phase I

Phase I consists of five underground storage sites, the pipelines required to connect the storage sites to distribution facilities, and a Federally-owned marine oil terminal at St. James, Louisiana. The Phase I storage sites are Bryan Mound in Texas and Bayou Choctaw, West Hackberry, Sulphur Mines, and Weeks Island, all in Louisiana. Four of these sites had existing solution-mined (leached) caverns and the fifth, Weeks Island, was a conventional salt mine. Construction of Phase I facilities began in July 1977 and was completed in 1980. All five sites have been filled to their combined Phase I storage capacity of approximately 260 MMB. An unobligated balance of $916,000 in Phase I funds was reprogrammed to Non-Phase Specific in the FY 1986 Interior and Related Agencies Appropriations Act, which is included in the FY 1986 Continuing Appropriations Act (P.L. 99-190).

Phases II and III

Phase II is the ongoing expansion of three Phase I sites. These sites and the Phase II capacity that was planned for each are as follows:

Bryan Mound	120 MMB
West Hackberry	160 MMB
Bayou Choctaw	10 MMB
Total	290 MMB

Phase III planned capacity had been 200 MMB, consisting of the further expansion of existing sites by 60 MMB, including 40 MMB at Bryan Mound, 10 MMB at West Hackberry and 10 MMB at Bayou Choctaw, plus the addition of Big Hill with a capacity of 140 MMB.

The FY 1986 Interior and Related Agencies Appropriations Act also provided for the reprogramming of $9,965,000 of Phase II funds and $70,094,000 of Phase III funds to Non-Phase Specific. These reprogrammings and the planned FY 1986 obligations in each of the Phases are reflected in the table below. As the table shows, $156,961,000 of the currently available Phase III funds will remain unobligated at the end of FY 1986 and, in view of the proposed moratorium on facilities development, these funds are being proposed for reprogramming to the Non-Phase Specific and Management budget categories in the amounts of $145,300,000 and $11,391,000, respectively.

	Phase II	Phase III
Unobligated Balance, October 1, 1985	$ 19,405	$ 231,289
FY 1986 Reprogramming	- 9,965	- 70,094
Planned FY 1986 Obligations	- 9,440	- 4,504
Balance for FY 1987 Reprogramming	$ 0	$ 156,691

The following sections describe the transition of the Phase II and Phase III sites. All sites will be in standby in FY 1987.

Bryan Mound

Leaching activities continued through December 1985, at which time the Phase II and Phase III leaching program for the site was approximately 95% completed. Surface construction at the site is complete, except for wetlands mitigation and the Physical Protection System, on which work will continue to completion in FY 1986.

West Hackberry

Leaching activities also continued at this site through December 1985, at which time Phase II leaching was approximately 89% completed and Phase III leaching (one cavern) about 13% completed. Work is in progress on the site Physical Protection System and will be completed in FY 1986.

Bayou Choctaw

Phase II capacity at this site consists of a single 10 MMB cavern (Cavern 17) acquired from a private sector firm in exchange for a smaller cavern (Cavern 102). Cavern 17, which was used to store ethane, has been certified for crude oil storage and the drilling and surface construction associated with preparing the cavern for SPR use has been initiated and will continue to completion in FY 1987. Phase III capacity also consists of a single cavern, the development of which has not proceeded beyond the drilling of cavern wells. Further effort on this cavern will be limited to completing ongoing design work.

Big Hill

Drilling of the fourteen planned caverns at the site has been completed and Stage 1A surface construction and the raw water intake structure are approaching completion. Planned FY 1986 procurements of Stage 2 surface facilities, the raw water and brine pipelines and the crude oil pipeline have been suspended and site activity is currently directed toward closing down the site and leaving it in an environmentally acceptable condition.

At the end of December 1985, the SPR underground storage capacity was approximately 509.4 MMB, located in the following manner:

	(millions of barrels)
Bryan Mound	198.6
West Hackberry	165.8
Sulphur Mines	26.0
Bayou Choctaw	46.0
Weeks Island	73.0
Total	509.4

Non-Phase Specific

FY 1986 Obligations	FY 1987 Base	FY 1987 Request
$ 187,184	$ 206,140	$ 136,521

The Non-Phase Specific budget category was established in FY 1981 to fund facilities requirements not directly associated with specific development phases of the SPR. Beginning in FY 1986, all activity except phase specific construction-related activity will be funded from Non-Phase Specific.

The following table presents the obligations plan for Non-Phase Specific by major function:

	FY 1986	FY 1987 Request
Operations	$ 106,826	$ 103,960
Operations Support	8,497	9,634
Capital Improvements	19,209	18,512
Distribution Enhancements	52,652 1/	4,415
Total	$ 187,184	$ 136,521

1/ Includes $20,652 initially planned for obligation in FY 1985.

Operations is a subcategory of funding that supports the following activities:

	(obligations) FY 1986	FY 1987 Request
Operations and Maintenance - ongoing operations, maintenance, spare parts, O&M contractor fee, drawdown, and terminal contracts	$ 86,651	$ 86,621
Security - security guards and equipment.	9,643	10,109
Utilities - electrical power for all sites.	9,536	5,841
Environmental - ongoing environmental requirements for all sites.	996	1,389
Total Operations	$ 106,826	$ 103,960

Operations and Maintenance (O&M) activities in FY 1986 and FY 1987 will be primarily carried out by Boeing Petroleum Services, Inc. (BPS) under a Management, Operations and Maintenance contract which became effective in mid-FY 1985. The functions for which BPS is responsible are O&M management and support and actual operations (primarily operational tests and crude oil movements associated with preventive maintenance) and maintenance work at the SPR sites. Other O&M functions will consist of those performed under DOE direct contracts associated with building leases, FTS communications, and standby terminalling.

O&M activities for most of FY 1986 and all of FY 1987 will focus primarily on maintaining SPR sites in a standby readiness mode. Estimated funding requirements are essentially the same for each year, with cost escalation in FY 1987 being offset by reductions in spares inventories.

Funding for Security in FY 1987 provides for the continuance of a level of security commensurate with that in FY 1986. The increase of $466,000 in the FY 1987 obligations level primarily reflects assumed cost inflation.

Planned obligations for Utilities in FY 1986 include the electric power requirements for leaching new storage capacity during the first three months of the fiscal year. There will be no similar activity during FY 1987, thus requirements will essentially be limited to minimum contractual obligations.

Environmental funding in FY 1986 and FY 1987 primarily covers activities necessary for compliance with applicable environmental codes, regulations and permitting requirements.

Operations Support provides for the following types of activity:

	FY 1986	FY 1987 Request
Continuing Engineering	$ 4,000	$ 4,260
Support Services	3,518	4,501
Special Projects	979	873
Total Operations Support	$ 8,497	$ 9,634

Continuing Engineering includes Systems, Geotechnical and Design Engineering effort.

The focus of Systems Engineering in the standby readiness mode is on the analysis and evaluation of drawdown readiness and drawdown test results, as well as analyses and evaluations related to implementation of emergency contingency plans, vulnerability analyses, quality assurance, and Reliability, Availability and Maintainability (RAM) activities consistent with DOE requirements.

The primary emphasis of the Geotechnical program is on salt characterization and creep studies; geological site and cavern characterization updates; and the application of models related to characterization of in situ oil mixing, cavern certification and recertification, cavern pressure-time histories, cavern creep data and drawdown exercises.

Design Engineering in the standby readiness scenario addresses the continuing need for feasibility studies, technical impact and cost-benefit analysis of proposed system changes, the development of standard specifications, and the preparation of conceptual designs and cost estimates for proposed projects.

Overall, the level of Continuing Engineering effort will not change significantly from FY 1986 to FY 1987.

The Support Services activity covers a broad range of support services across all areas of the SPR. Typical examples of the types of services provided are:

- Implementing and monitoring management and technical controls to enhance project management;
- Monitoring of other contractor activities to provide a single source of management information;
- Support to operations activities in the areas of electric power distribution and analyses, integrated logistics, and RAM implementation (e.g. failure analyses);

- o Support for specialized reproduction services; and
- o Support and training for Site Operations Model (SOM) and Site Availability Model (SAM).

The apparent 28% increase in FY 1987 request level obligations for these Support Services is due to the transfer of funding requirements for Systematic Management Services, Inc. (SMS) from the Management budget to Non-Phase Specific beginning in FY 1987. The decision to make this shift ($1 million) is based on the conclusion that the support services of SMS are not unique to the management function.

Special Projects funding covers activities that do not readily fit into the other Operations Support categories. In FY 1986 and FY 1987, these activities include Department of Defense contract administration services and the continuation of Sandia National Laboratories' work on an overall security systems plan. FY 1987 request level obligations reflect a reduced effort in both of these areas.

Capital Improvements addresses the need for modifications or additions to existing facilities to assure that mission objectives can continue to be met. Projects covered by this subcategory of funding are outside the scope of normal maintenance and usually require engineering design and analyses. Projects are identified as a result of operating experience and safety, hazard, reliability and vulnerability assessments and studies.

FY 1986 and FY 1987 obligations by activity are as follows:

	FY 1986	FY 1987 Request
Design/Engineering	$ 3,990	$ 3,304
Construction	12,582	12,484
Construction Management	2,637	2,724
Total Capital Improvements	$ 19,209	$ 18,512

The FY 1987 Capital Improvements construction program is planned to include the following major projects:

Bryan Mound	
Deluge Fire Protection System	$ 4,700
Phase II Piping System Changes	900
Permanent Facilities Addition	771
Bayou Choctaw	
Control Room Integration	1,722
Permanent Facilities Addition	351
Weeks Island	
Permanent Facilities Addition	613
St. James	
Deluge Fire Protection System/Alarms	2,280
Permanent Facilities Addition	320
Subtotal	$ 11,657
All Other Projects	827
Total	$ 12,484

The deluge fire protection systems for Bryan Mound and St. James are two of six planned systems, three of which (West Hackberry, Bayou Choctaw and Sulphur Mines) were funded in FY 1985 under the SPR Transition Plan. The remaining system, i.e., Weeks Island, is currently planned to be funded in FY 1988.

The permanent facilities additions are to replace existing temporary office and warehouse facilities (trailers and temporary structures) which are overcrowded and do not meet DOE criteria for fire protection.

FY 1987 Design/Engineering work includes tasks related to warehouse facilities, roads, crash out gates and security enhancements.

Distribution Enhancements was introduced as a Non-Phase Specific funding subcategory in the FY 1986 budget to address major changes in the commercial crude oil distribution systems which have limited SPR distribution capability to 2.3 million barrels per day (B/D).

The current program for Distribution Enhancements provides for completion of the necessary Seaway Complex enhancements. However, plans for the Texoma Complex enhancements have been revised and new plans for Capline Complex enhancements have been added. The rationale for these changes is described below.

Texoma Complex

The SPR Distribution Capability Analysis, completed in 1984, concluded that the Sun Terminal was internally constrained in its distribution of SPR crude. As such, distribution enhancements to the Sun Terminal were proposed to permit maximum simultaneous distribution to Sun docks and local pipelines. However, subsequent detailed engineering studies of the Sun Terminal and revised analyses of expected local refinery demand for SPR crude oil disclosed that:

- o The Sun Terminal's internal operational restrictions are less significant than originally believed and, therefore, previously proposed modifications would not substantially increase the terminal's throughput.

- o Refining capacity changes in the Beaumont/Port Arthur, Texas area have resulted in a strong likelihood of insufficient local demand to achieve the Sun Terminal's maximum throughput rate.

This analysis concluded that the Sun Terminal's distribution capability, based on projected refinery demands and sustainable tanker loading operations, is approximately 1,200,000 B/D. Further, without constructing additional terminal docks or refinery pipeline connections, the Sun Terminal distribution capability cannot be substantially increased. As a result, implementation plans for the prior Sun Terminal enhancements have been cancelled.

Capline Complex

The 1984 SPR Distribution Capability Analysis, as well as the December 1984 NPC Report on the Capability to Distribute SPR Oil, noted deficiencies in achieving the maximum drawdown/distribution rate in the Capline Complex; however, no distribution enhancements were proposed at that time. Subsequent engineering studies and analyses have been completed and revealed the need for distribution enhancements to alleviate St. James Terminal constrictions on simultaneous pipeline and dock distribution and operational restrictions associated with distribution via the LOCAP Terminal. Without distribution enhancements, the sustainable Capline distribution capability, taking into account potential demand variances, is estimated to be 730,000 B/D.

Distribution enhancements which are proposed for FY 1987, to achieve a Capline distribution capability commensurate with the current drawdown capability of 830,000 B/D, are:

- o Installation and modification of DOE pumps and metering systems at the St. James Terminal to permit simultaneous distribution to DOE docks, LOCAP and Capline Terminals; and

- o Construction of a direct DOE connection to the Capline Terminal to alleviate potential operational impacts on LOOP/LOCAP pipeline operations.

The table below summarizes the current drawdown and distribution performance characteristics of the SPR and those under the proposed Distribution Enhancements program.

INITIAL (90-DAY) DISTRIBUTION CAPABILITY
(Thousands of Barrels Per Day)

	Current	Proposed
SPR Drawdown Rate	3,330	3,330
Rated Distribution Capability		
Seaway	390	1,100
Capline	730	830
Texoma	1,200	1,200
Total	2,320	3,130

The FY 1987 request of $4,415,000 for Distribution Enhancements completes the funding for the proposed program.

(tabular dollars in thousands; narrative material in whole dollars)

	FY 1986 Obligations	FY 1987 Base	FY 1987 Request
MANAGEMENT	$ 15,500	$ 16,270	$ 13,423

Beginning in FY 1987, Management will replace Planning and Management Support and Program Direction as funding categories in the SPR budget. At the present stage of facilities development, with or without a moratorium, activities currently being funded as Planning and Management Support activities are more appropriately described as part of overall Federal management of the SPR program.

The FY 1987 request level of obligations for Management is $13,423,000 a decrease of $2,077,000 from the combined FY 1986 levels for Planning and Management Support and Program Direction.

Management funding provides for all SPR personnel costs, the administrative expenses related to maintaining a wholly dedicated Project Management Office, and contract services required to support management and technical analyses of SPR program issues.

The following table provides a breakdown of the FY 1986 and FY 1987 obligations plan for Management.

	FY 1986	FY 1987	FY 1987 Change
Personnel Compensation	$ 7,033	$ 6,007	$- 1,026
Benefits	1,701	1,801	+ 100
Travel and Transportation	845	750	- 95
Rent, Communications, Utilities	1,369	1,478	+ 109
Other Services	4,552	3,387	- 1,165
Total	$ 15,500	$ 13,423	$- 2,077

The FY 1987 funding changes in the personnel compensation area are a result of the proposed moratorium on further SPR development beginning in January 1986.

The organizational distribution of SPR manpower is shown below:

	FY 1985	FY 1986	FY 1987 Request
Headquarters:			
Program Office	40	27	22
Field Operations:			
Oak Ridge Operations Office	7	5	4
Project Management Office	131	120	94
Total Strategic Petroleum Reserve	178	152	120

As the table above shows, the proposed FY 1987 manpower level is a decrease of 32 from FY 1986 and a decrease of 58 from FY 1985, reflecting the proposed reduced use of Federal personnel to manage the SPR in a standby operations mode. Activities during FY 1987 will include implementation of the distribution enhancements program; oversight of contractors providing standby operation, maintenance, and security services; conversion of SPR storage caverns to a standby drawdown readiness mode; continued review of inventory and cavern integrity; and continuing analyses of distribution capabilities.

Other Services funds management and technical support necessary to address operational and management issues critical to achieving SPR goals and objectives. Other Services also will provide funding to support ongoing drawdown and distribution capability assessment and evaluation activities, SPR operational and management information systems, analysis of crude oil types and compatibility, addressing alternatives for selling SPR oil during drawdown, and maintaining readiness to resume further SPR development by assessing configuration and crude mix alternatives. The apparent $1.2 million decrease in planned FY 1987 obligations for Other Services is due mainly to the previously discussed transfer of $1 million for FY 1987 support services to the Non-Phase Specific category of the Storage Facilities Development and Operations budget.

(tabular dollars in thousands; narrative material in whole dollars)

	FY 1986 Obligations	FY 1987 Base	FY 1987 Request
SPR PETROLEUM ACCOUNT	$ 147,494	$ 0	$ 0

Funds are appropriated to the SPR Petroleum Account for the purchase of crude oil, marine and pipeline transportation, customs fees, terminalling charges, environmental taxes and other necessary oil acquisition-related expenses. Pursuant to the provisions of the Energy Policy and Conservation Act (EPCA) of 1975 as amended and SPR Plan Amendment No. 4, funds in the Account may also be used to finance costs associated with a drawdown of the Reserve. Additionally, the Federal receipts from a drawdown and sale of SPR oil create additional budget authority for refilling the Reserve.

The Energy Policy and Conservation Amendments Act of 1985 (P.L. 99-58), which extended the SPR program authorities to June 30, 1989, also established a requirement for the test sale or exchange of approximately 1.1 MMB of SPR crude oil. This sale was commenced on November 18, 1985 by issuance of a Notice of Sale of 1.1 MMB to seventy-two potential purchasers. Seventeen offers were received for a total of approximately 7.2 MMB and, during the week of December 2, 1985, five contracts were awarded for a total of 1.0 MMB. Deliveries under the contracts commenced on December 11, 1985 and were completed in January 1986. A total of 966,809 barrels were delivered and the resulting deposits in the SPR Petroleum Account amounted to approximately $27,949,000.

In compliance with current law, fill of the SPR will continue in FY 1986 to a level of 500 MMB less test sale deliveries of approximately 1 MMB. As previously discussed, the Administration will propose the elimination of the legislative requirement concerning further SPR oil acquisition and linkages to Naval Petroleum Reserve production and sales. No fill is planned in FY 1987.

Based on the Department's current estimate, $577,534,000 of SPR Petroleum Account funds will not be needed to complete the required 500 MMB fill and, as indicated in the summary below, these funds are proposed for deferral.

Petroleum Acquisition and Transportation
Activity Summary

Total appropriations through FY 1985	$ 15,136,057
FY 1986 reprogramming of unobligated balance of on-budget funds	- 12,964
Lapsed on-budget funds	- 1,925
Balance of appropriations	$ 15,121,168
Obligations through FY 1985	-14,424,089
Balance available in FY 1986	$ 697,079
FY 1986 SPR test sale receipts	27,949
Total Available in FY 1986	$ 725,028
Planned FY 1986 Obligations for 500 MMB fill	- 147,494
Balance proposed for deferral	$ 577,534

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

STRATEGIC PETROLEUM RESERVE

KEY ACTIVITY SUMMARY
(in thousands of dollars)

KEY ACTIVITY	ACTUAL ACTIVITIES DURING FY 1985	ESTIMATED ACTIVITIES DURING FY 1986	PLANNED ACTIVITIES DURING FY 1987
Storage Facilities Development and Operations:			
Phase I	No Activity	No Activity	No Activity
Phase II	Completed Phase II surface construction and continued leaching of Phase II capacity at Bryan Mound and West Hackberry. Acquired Cavern 17 at Bayou Choctaw in exchange for Cavern 102. (Obligations of $46,067)	Continue leaching at Bryan Mound and West Hackberry through 12/31/85. Drill Cavern 17 at Bayou Choctaw and initiate surface construction associated with preparing the cavern for possible future oil storage. (Obligations of $9,440 from funds appropriated in prior years)	Complete work on Bayou Choctaw Cavern 17. (Obligations of $0)

KEY ACTIVITY	ACTUAL ACTIVITIES DURING FY 1985	ESTIMATED ACTIVITIES DURING FY 1986	PLANNED ACTIVITIES DURING FY 1987
Phase III	Continued with ongoing Phase III construction and leaching at Bryan Mound and West Hackberry. Cavern drilling at Big Hill was completed and Stage 1A construction and the raw water intake structure were approaching completion. (Obligations of $53,577)	Complete Phase III construction at Bryan Mound and West Hackberry and continue Phase III leaching through 12/31/85. Complete Stage 1A construction and the raw water intake structure at Big Hill and close down the site. (Obligations of $4,504 from funds appropriated in prior years)	No Activity

KEY ACTIVITY	ACTUAL ACTIVITIES DURING FY 1985	ESTIMATED ACTIVITIES DURING FY 1986	PLANNED ACTIVITIES DURING FY 1987
Non-Phase Specific	Continued activities in support of capacity development and oil fill through FY 1985. Also continued with the SPR Capital Improvements program and initiated the Distribution Enhancements program to improve the capability to distribute SPR oil during drawdown. (Obligations of $106,636)	Continue activities in support capacity development through 12/21/85 and oil fill through 1/31/86. Activities thereafter will focus on moving the SPR to a standby readiness mode and continued implementation of the Capital Improvements and currently proposed Distribution Enhancements program. (Obligations of $187,184 including $136,437 from funds appropriated in prior years)	Maintain all SPR sites in standby readiness mode; continue with Capital Improvements program; and complete currently proposed Distribution Enhancements program. (Obligations of $136,521 from funds appropriated in prior years)

KEY ACTIVITY	ACTUAL ACTIVITIES DURING FY 1985	ESTIMATED ACTIVITIES DURING FY 1986	PLANNED ACTIVITIES DURING FY 1987
Petroleum Acquisition and Transportation	Filled the SPR at an average daily rate of 159,000 barrels per day, to a total of 489.3 million barrels at the end of FY 1985. (Obligations of $1,367,567)	Continue oil fill to a level of 500 million barrels, less SPR test sale deliveries. (Obligations of $147,494 from funds appropriated in prior years)	No Activity
Management	Continued activities necessary to plan and manage development and fill of the SPR, including information gathering, analytic work and technical support. (Obligations $16,585)	Continue planning, management and other activities to the extent necessary to support continued operations and fill for part of the year and standby operations thereafter. (Obligations $15,500 including $4,014 from funds appropriated in prior years)	Continue those activities essential to planning and managing the SPR in a standby readiness mode. (Obligations $13,423 from funds appropriated in prior years)

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
STRATEGIC PETROLEUM RESERVE

OBJECT CLASS - STORAGE FACILITIES DEVELOPMENT AND OPERATIONS
(In thousands of dollars)

89-0218-0-1-274	FY 1985 actual	FY 1986 estimate	FY 1987 estimate
Direct Obligations:			
25.0 Other Services			
Total obligations ...	$ 206,280	$ 201,128	$ 136,521

	FY 1987 Base		FY 1987 Estimate		Increase (+) or Decrease (-)	
	FTE	Amount	FTE	Amount	FTE	Amount
Direct Obligations:						
25.0 Other Services	---	$ 362,554	---	$ 136,521	---	$- 226,033
Total obligations ...						

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
STRATEGIC PETROLEUM RESERVE

OBJECT CLASS - MANAGEMENT
(In thousands of dollars)

89-0218-0-1-274		FY 1985 actual	FY 1986 estimate	FY 1987 estimate
Direct Obligations:				
11.1	Full-time permanent ..	$ 6,948	$ 6,653	$ 5,621
11.3	Other than full-time permanent	333	330	264
11.5	Other personnel compensation	31	50	122
12.1	Personnel benefits: Civilian	801	900	839
13.0	Benefits for former personnel	0	801	962
21.0	Travel and transportation of persons ..	558	845	750
22.2	Transportation of things	(4)	41	47
23.2	Communications, utilities, and other rent	730	1,182	1,279
24.0	Printing and reproduction	2	43	45
25.0	Other services	6,004	4,552	3,387
26.0	Supplies and materials	2	103	107
31.0	Equipment	200	0	0
41.0	Grants, Subsidies and Contributions ..	980	0	0
	Total obligations	$ 16,585	$ 15,500	$ 13,423

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
STRATEGIC PETROLEUM RESERVE

OBJECT CLASS - MANAGEMENT
(In thousands of dollars)

	(On Budget)	Fiscal Year 1987 Base FTE	Fiscal Year 1987 Base Amount	Fiscal Year 1987 Estimate FTE	Fiscal Year 1987 Estimate Amount	Increase (+) or decrease (-) FTE	Increase (+) or decrease (-) Amount
Direct Obligations:							
11.1	Full-time permanent ..	---	$ 6,858	---	$ 5,621	---	$- 1,237
11.3	Other than full-time permanent	---	292	---	264	---	- 28
11.5	Other personnel compensation	---	163	---	122	---	- 41
	Total personnel compensation	152 1/	$ 7,313	120	$ 6,007	- 32	$- 1,306
12.1	Personnel benefits: Civilian		1,113	---	839	---	- 359
13.0	Benefits for former personnel	---	0	---	962	---	+ 962
21.0	Travel and transportation of persons ..	---	845	---	750	---	- 95
22.0	Transportation of things	---	47	---	47	---	0
23.2	Communications, utilities, and other rent	---	1,279	---	1,279	---	0
24.0	Printing and reproduction	---	45	---	45	---	0
25.0	Other services	---	4,914	---	3,387	---	- 1,527
26.0	Supplies and materials	---	107	---	107	---	0
31.0	Equipment	---		---		---	0
	Total obligations	152 1/	$15,663	120	$13,423	- 32	$- 2,240

1/ FTE allowance level for transition to moratorium.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
STRATEGIC PETROLEUM RESERVE

OBJECT CLASS - PETROLEUM ACQUISITION AND TRANSPORTATION
(In thousands of dollars)

89-0233-0-1-274	FY 1985 actual	FY 1986 estimate	FY 1987 estimate
Direct Obligations:			
25.0 Other services			
SPR off-budget program	$ 1,367,567	$ 147,494	$ 0
Total obligations	$ 1,367,567	$ 147,494	$ 0

	FY 1987 Base		FY 1987 Estimate		Increase (+) or Decrease (-)	
	FTE	Amount	FTE	Amount	FTE	Amount
Direct Obligations:						
25.0 Other services						
SPR off-budget program	---	$ 0	---	$ 0	---	$ 0
Total obligations	---	$ 0	---	$ 0	---	$ 0

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
1987 CONTRACT LISTING
STRATEGIC PETROLEUM RESERVE
(In Thousands of Dollars)

	Estimated Amount
Storage Facilities Development Operations	
o Operations/Operations Support	
- Boeing Petroleum Services	$ 84,812
- Wells Fargo Guard Services	10,109
- General Services Administration	5,841
- Systematic Management Services	4,200
- Aerospace Corporation	2,600
- Sandia National Laboratories	1,525
- Defense Contract Administration Services	873
- Walk, Haydel and Associates	500
- U. S. Government Printing Office	61
- To Be Determined	3,073
Subtotal	$113,594
o Capital Improvements	
- Walk, Haydel and Associates	3,304
- Boeing Petroleum Services	2,724
- To Be Determined	12,484
Subtotal	$ 18,512
o Distribution Enhancements	
- To Be Determined	4,415
Total, Storage Facilities Development and Operations	$136,521
Management	
o Analytic Support Services - Headquarters	$ 2,337
o Software Enhancements and Data Systems Support	1,050
o Rent, Communications and Utilities - Field Office	1,478
Total, Management	$ 4,865

DEPARTMENT OF ENERGY

Proposed Appropriation Language

Emergency Preparedness

For necessary expenses in carry out emergency preparedness activities, $6,044,000. (Department of the Interior and Related Agencies Appropriations Act, 1986, as included in Public Law 99-190.)

DEPARTMENT OF ENERGY

FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF ESTIMATES BY APPROPRIATION BY MAJOR ACTIVITY

EMERGENCY PREPAREDNESS

BUDGET AUTHORITY IN THOUSANDS OF DOLLARS

	FY 1985 Actual	FY 1986 Estimate	FY 1987 Request
Total, Energy Emergencies	$ 6,045	$ 5,750	$ 6,044

Department of Energy

FY 1987 Congressional Budget

PROGRAM OVERVIEW

Emergency Preparedness

The Emergency Preparedness Program supports the goal of an adequate and secure supply of energy in the United States at reasonable costs. This means sufficient energy to meet our nation's short and long-term needs, along with an ability to analyze possible risks in order to avoid undue dependence on any single source of supply where severe interruption of that supply would jeopardize our economy, strategic capabilities, or defense energy requirements. The underlying policy is based upon the assumption that effective energy emergency preparedness rests on the development of processes for anticipating and responding to a multitude of potential national security-related threats. In particular, the program seeks to promote energy stability, energy security and energy strength through the following objectives:

- o Reduce the Nation's vulnerability to severe energy supply disruptions,
- o Ensure adequate fuel for defense needs (including mobilization), for fulfilling U.S. treaty obligations, and for other vital national security purposes,
- o Honor other U.S. obligations in international treaties and agreements,
- o Maintain an ongoing energy supply & demand analytical capability to anticipate and assess possible risks and/or disruption to the Nation's energy supply network.
- o Ensure the preparedness for Continuity of Government (COG) emergencies involving actions to maintain the essential functions of government before, during, and after a national defense emergency.

The Emergency Preparedness Program is based upon a fundamental recognition that our nation will remain vulnerable through this decade to the risk of various types of energy supply disruptions. The Emergency Preparedness Program was established to provide a coordinated national capability for helping to reduce the Nation's vulnerability to severe energy supply disruptions, and to mitigate adverse impacts on the Nation in the event of a severe energy supply shortage or a disruption to the Nation's energy systems.

This program also supports the Department's continuation of the essential functions of the government in the event of mobilization or war. The Emergency Preparedness Program is designed as a staff support function, consisting of a highly trained professional cadre with institutional knowledge and experience in various forms of energy (petroleum, gas, coal, and electricity) and other energy industry operations and energy market analysis, using the latest ADP and analytical tools. This cadre can be augmented by other industry experts and Departmental personnel in an energy emergency. The strategy for accomplishing these objectives includes utilization of in-house federal staff supported by integrated energy information systems and other departmental data resources, coupled with policies and procedures to effectively use the Strategic Petroleum Reserve, and participation in a program of exercises to demonstrate our ability to fulfill U.S. commitments to allies, the International Energy Agency, NATO, and for coordination with State governments and industry.

FY 1986 Accomplishments:

The following are planned activities and accomplishments for FY 1986. The benefit of these accomplishments will be to provide an enhanced national capability to prevent, prepare for, and possibly respond to threats to our Nation's energy security.

- Conduct analyses to assess the vulnerability of the Nation's energy supplies and resources to possible threats, including sabotage, terrorism, acts by hostile foreign governments and natural disasters. These analyses will include completion of a study on refinery vulnerabilities. Results of these studies will enhance preparedness measures which prevent or reduce the likelihood of these events from affecting our national security.

- Establish a unified process (Energy Emergency Management System) for conducting Department preparations for and responses to a wide range of potential energy emergencies. This system will enhance the effectiveness of the Department's energy emergency decisionmaking and operations processes.

- Provide technical studies for National Security Council-mandated classified defense energy taskings, develop the Federal Resource Assistance System (FRAS). Begin a wartime energy requirements study with DOD. Continue planning and coordination of DOE participation in Federal Emergency Management Agency civilian readiness, continuity of government, and defense-related exercises. The FRAS supports Defense Production Act implementation in the event of a national defense emergency to support defense requirements.

- Initiate additional planning for the implementation of Defense Production Act responsibilities to include specialized applications of the priority rating system to support mobilization transportation requirements, a key part of ensuring that defense-related resource needs are fulfilled in the event of a national defense emergency.

- Manage the recruiting and training of Joint Operations Staff (JOS) personnel to fulfill NATO Wartime Oil Organization functions. Develop detailed JOS management plans in coordination with Canadian Government officials and JOS management. Develop plans and operating procedures for the operation of the NATO Wartime Oil Organization - West at its wartime relocation site. The NATO Wartime Oil Organization is designed to ensure that NATO alliance defense energy needs are met in the event of war and mobilization for war.

- Continue major work on defense energy needs to support various scenarios including industrial defense related energy needs, and support for other defense transportation needs in a major emergency. This work is necessary to ensure that defense-related resource needs can be met in a national defense emergency.

- Continue evolving a total, integrated DOE Continuity of Government (COG) Plan, and provide training for DOE COG teams. This effort provides for the continuation of essential governmental activities in a national emergency.

- Continue technical support for IEA, NATO, and other international energy agency activities in coordination with other DOE organizations Provide technical support and analysis for bilateral energy matters. Conduct, evaluate, and participate in follow-on activities concerning the Allocation Simulation Test (AST-5) exercise. Prepare report to the IEA on U.S. participation in AST-5. These efforts ensure the ability of the U.S. to implement international agreements and obligations such as those of the International Energy Agency and North Atlantic Treaty Organization to support energy security objectives.

- Provide representation and technical support for participation in the international policy and planning activities of the IEA Standing Committee on Emergency Questions (SEQ). The SEQ coordinates energy emergency preparedness issues for the International Energy Agency.

- Review adequacy of plans to implement U.S. energy commitments to our allies under treaty obligations for a range of emergencies. This review ensures that energy security objectives can be met.

- Conduct evaluations of energy emergency exercises to ensure a systematic approach to "lessons learned" as well as improved energy emergency response planning, policy analysis, and operations.

- Support conduct of Strategic Petroleum Reserve (SPR) test sale, and perform monitoring functions to enable a fully documented report on the test sale. This sale has successfully demonstrated our capability to sell oil from the SPR in accordance with established regulations and procedures.

- Continue program and procedure modifications resulting from new policy formulations and follow-up studies performed for the Department (eg: FY 85 National Petroleum Council study); incorporate information from IEA coordinated stock drawdown policies into SPR policy analyses. These efforts serve to ensure that SPR policy and procedures are coordinated with international efforts on use of stocks in the event of an energy supply disruption.

- Continue development and analysis of policies and programs to support public information activities in accordance with energy emergency response strategy. Effective public information activities are important to maintaining public confidence in governmental energy emergency preparedness programs in time of emergency.

- Continue maintaining the Department's Executive Reserves by recruiting and training new members and integrating the Reservists with DOE regional emergency activities. These activities ensure that an effective National Defense Executive Reserve comprised of industrial technical experts is available in the event of national emergency to augment governmental resources.

- Operate the electronic mail system linking DOE with state energy offices and others. This system is an important part of our capabilities to meet public information objectives in non-emergency and emergency periods by providing current energy information.

- Continue the preparation of assessments and analyses of the vulnerability of the Nation's energy systems to actual or potential "near-term" disruptions. These analyses will be prepared in response to potential events which may occur nationally or internationally during the fiscal year.

- Refine, integrate and maintain specialized energy data bases to support emergency operations activities including support for several classified projects.

- Continue to develop and implement an automated Energy Emergency Decision Support System to provide situation analysis on domestic and international events. Continue to refine and develop departmental emergency response procedures.

- Assist the DOE Telecommunications Office in its work with the National Communication System in developing an Emergency Communications System for the DOE. This effort supports Government objectives to provide for an effective communication system in the event of national emergency.

- Maintain operations readiness for energy emergency situations including ADP, reference, classified documents, communications, Alert Coordination Officer system, and logistics requirements. These operational resources and activities support the total DOE emergency preparedness program.

- Analyze emergency options focusing on SPR status, assess SPR requirements and use based upon current market conditions, the international situation, and fiscal conditions. These analyses ensure that preparedness is maintained to successfully use the SPR in the event that emergency conditions so require.

SPECIFIC OBJECTIVES FOR FY 1987 to FY 1990 FORMULATED IN RESPONSE TO PUBLIC LAWS ARE:

- o Development and support for supply enhancement strategies particularly as relates to the Strategic Petroleum Reserve as required by the Energy Policy and Conservation Act (EPCA).

- o Development and support for international energy security activities with emphasis on analysis and planning for U.S. participation in the International Energy Agency and NATO energy emergency preparedness requirements as required by the Energy Policy and Conservation Act (EPCA) and the Defense Production Act (DPA).

- o Development and support for a wide range of defense energy emergency preparedness activities as required by the Energy Policy and Conservation Act (EPCA), the Defense Production Act (DPA), various Executive Orders and Federal Preparedness Circulars, and the International Emergency Economic Powers Act (IEEPA).

- o Conduct of energy supply adequacy, risk assessments and analyses of the vulnerability of the Nation's energy systems required by the Federal Power Act (FPA), the Natural Gas Act (NGA), the Public Utility and Regulatory Policies Act of 1978 (PURPA), the Fuel Use Act (FUA) and the Energy Policy and Conservation Act (EPCA).

- o Continue the development and maintenance of an operational Emergency Executive Reserve Program as authorized by the Defense Production Act (DPA).

- o Development and maintenance of an energy emergency operations capability to ensure preparedness for Continuity of Government (COG) emergencies and energy supply disruptions as authorized by the Federal Power Act (FPA), Defense Production Act (DPA), Federal Civil Defense Act (FCDA), Energy Policy and Conservation Act (EPCA) and the Department of Energy Organization Act, and the Disaster Relief Act of 1974.

- o Development and implementation of an Energy Emergency Management System, to better organize the Government's preparedness for and responses to energy emergencies, as authorized by the Department of Energy Organization Act, the Energy Policy and Conservation Act (EPCA), and the Federal Power Act (FPA).

The accomplishment of energy emergency preparedness program objectives will contribute to reducing the Nation's vulnerability to energy supply disruptions, and to mitigate adverse impacts on the Nation in the event of shortages or disruptions of the energy supply systems. The strategy for the achievement of these objectives emphasizes coordination with industry; and promoting fulfillment of U.S. commitments to allies, the International Energy Agency, NATO, and the maintenance of our national security. Administration policy assumes that effective energy emergency preparedness lies in developing processes for anticipating and responding to a multitude of potential crisis situations. We will continue to view the accomplishment of program objectives in accordance with our belief that preparedness is a constantly evolving, changing set of strategies, which are continually adapted to new foreign and domestic circumstances.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE
EMERGENCY PREPAREDNESS
(Tabular dollars in thousands. Narrative material in whole dollars.)

	FY 1985 Appropriation	FY 1986 Adjusted Appropriation	FY 1987 Base	FY 1987 Request	Request vs Base
Emergency Preparedness					
Emergency Planning:					
Operating Expenses. . .	$ 500	$ 555	$ 555	$ 450	$ -105
Subtotal.	$ 500	$ 555	$ 555	$ 450	$ -105
Emergency Operations:					
Operating Expenses. . .	$ 766	$ 420	$ 420	$ 368	$ - 52
Subtotal.	$ 766	$ 420	$ 420	$ 368	$ - 52
Program Direction:					
Operating Expenses. . .	$4,779	$4,775	$5,076	$5,226	$ +150
Subtotal.	$4,779	$4,775	$5,076	$5,226	$ +150
Total:					
Operating Expenses. . .	$6,045	$5,750	$6,051	$6,044	$ -7
Emergency Preparedness.	$6,045	$5,750	$6,051	$6,044	$ -7
Staffing Total FTE's	74	71	71	71	0

Authorization: Federal Power Act Sections 202 (a,c-e), 311; Defense Production Act - Sections 101 (a-c), 708, 710; Public Utility Regulatory Policies Act - Sections 210, 204, 209, 607; Natural Gas Policy Act - Title III; Power Plant and Industrial Fuel Use Act - Sections 404, 405; Department of Energy Act - Sections 101, 102; International Emergency Economic Powers Act - Title III; Trade Expansion Act - Section 232(b); Energy Policy and Conservation Act - Sections 106(a)(2), 106(b)(2), 151-161, 252, 271; Export Administration Act of 1979 - Section 7(d)(3); Clean Air Act - Section 110(f); Energy Emergency Preparedness Act of 1982; Export Administration Amendments Act of 1985 - Sections 126, 203; Executive Orders 11490, 10647, 10421, 10480.

Department of Energy

FY 1987 Congressional Budget Request

Adjustments to FY 1986 Appropriations

	FY 1986 Conference	Gramm-Rudman-Reduction	Subtotal	Adj. Approp. Total
Emergency Preparedness				
Emergency Preparedness	$ 6,008	$ -258	$5,750	$5,750
Total, Emergency Preparedness	$ 6,008	$ -258	$5,750	$5,750

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF CHANGES

EMERGENCY PREPAREDNESS

FY 1986 Appropriation enacted.	$5,750
Built in increases and decreases:	
° Increases for within grades and merit pay increases	+ 120
° Increases for administrative overhead	+ 181
FY 1987 Base	$6,051
Program increases and decreases:	
° Increase for full support of 71 FTE's	+ 150
° Decrease to Emergency Planning Contracts.	- 105
° Decrease to Emergency Operations Contracts.	- 52
FY 1987 budget request	$6,044

NARRATIVE JUSTIFICATION

GOALS/OBJECTIVES

During FY 1987, the Emergency Preparedness Program will continue to emphasize energy security-related preparedness activities internationally and domestically. Our participation in a variety of energy emergency preparedness tests and exercises will allow us to provide an integrated approach to policy analysis, emergency planning, and operations; while determining those areas that require new responses or priority attention by the Executive and Legislative branches of government.

As the Emergency Preparedness Program progresses, we are better able to focus our resources on supporting a limited number of national security-related objectives. We are developing energy security-related plans/analyses, conducting analysis and evaluations of important policy issues, supporting supply enhancement strategies which focus on the use of the Strategic Petroleum Reserve, and participating in international energy security activities which involve the International Energy Agency and NATO. Additionally, we are developing national emergency/continuity of government plans/procedures, analyzing defense energy requirements, and refining public information/outreach strategies. We are also committed to providing rapid risk assessment and analytical capabilities as required by senior Departmental officials in response to ongoing threats to our energy security and in support of our international obligations. Finally, we will provide significant support to the Office of the Secretary in the development, testing, coordination of Departmental emergency response procedures, and in a special series of classified tasks.

Accordingly, the FY 1987 Energy Emergency Preparedness Program will:

- Analyze actual or prospective disruptions to energy systems, and possible responses to such disruptions; assess national security and other critical national energy needs, and how best to meet these needs. Special emphasis will be placed on the conduct of analyses to identify and assess plausible threats to energy systems security, and the evaluation of alternative measures to respond to or at least mitigate such threats.

- Be responsible , in collaboration with other Departmental elements, for overall development, implementation, testing and evaluation of Departmental energy emergency preparedness policies, plans, and operations (with the exception of nuclear-related accidents). Emphasis will be placed on evaluating the potential impacts on our economy and national security from severe energy supply disruptions .

- Such policies and programs will include planning and testing activities prior to energy emergencies to mitigate the adverse impacts of an emergency emphasize public information programs and provide for effective use of supplies (through utilization of the U.S. Strategic Petroleum Reserve).

- Initiate planning efforts to ensure effective U.S. capability and preparedness to meet international commitments to the International Energy Agency (IEA), the North Atlantic Treaty Organization (NATO), and other countries. The program will provide key resources to develop plans and programs to support U.S. participation in the IEA emergency sharing system, Allied stock drawdown decisions and the NATO civil emergency preparedness activities.

- The program will obtain and interpret, in conjunction with others, necessary information on market operations, national security conditions and other relevant circumstances to monitor both domestic and international areas and assess the impact of events on supply availability, the U.S. economy, trade policy, and the national security. Such assessments will be based upon current and projected information on energy prices and supplies, inventories, marketing activities. These assessments and other situation analyses will also be prepared for emergency conditions and will be disseminated to states and local governments and the general public as part of a Federal emergency response effort. We will also examine and evaluate impacts of changes from pre-emergency conditions to emergency energy supply and national defense mobilization conditions.

- Develop, implement and enhance systems to ensure the efficient operation of the Department's emergency response policies and programs prior to and during emergencies.

- Conduct assessments regarding the national security and defense implications of energy emergency response policies and programs to assure that they are in coordination with other U.S. agencies. This will be accomplished through participation in classified national defense tests and exercises, involvement in senior-level working groups and ongoing program analyses.

Within the Department, we are moving ahead with refinement and further development of support systems for facilitating efficient and reliable emergency response decisionmaking and program implementation. (See table of descriptions of ongoing data systems in place and under development.) Our experiences gained in conducting major tests and evaluations have contributed greatly to directing further improvements to the Department's energy emergency preparedness capabilities, e.g., further enhancement of specialized data bases and logistics to support the Department's responsibilities for continuity of government and special classified activities as specified in various Executive Orders and Federal Preparedness Circulars.

The establishment of an Energy Emergency Policy & Evaluation function within the Energy Emergency Preparedness Program has resulted in a greater emphasis on the ability to perform rapid analysis of energy emergency policy issues and provide a focal point for ongoing energy emergency policy analysis and evaluation activities. This means that the program is better able to incorporate significant "lessons learned" from the various preparedness exercises in order to improve our response strategies and procedures. Additionally, we will develop a variety of risk assessment and vulnerability assessment tools in order to support the critical energy system vulnerability projects now under way including the continued identification of threats to major energy supply systems, research of specific vulnerabilities and their probable impacts, and the development of cost-effective mitigation strategies which can be made available to appropriate parties.

Finally, the program will maintain in-house expertise for planning and operations as the most effective strategy for accomplishment of Administration policy objectives during an energy emergency. This approach maintains a small group of experienced professionals who can be quickly augmented in an energy emergency by National Defense Executive Reservists (if appropriate) and other Departmental personnel. The FY 1987 request is $6,044,000 and 71 FTE, essentially unchanged from FY 1986. Specific activities for which funding is sought are described under Emergency Planning expenses, Emergency Operations expenses and Program Direction.

EMERGENCY PLANNING FY 1987 ACTIVITIES

	FY 1985	FY 1986	FY 1987
Emergency Planning Operating Expenses	$ 500	$ 555	$ 450

The FY 1987 request for Emergency Planning is $ 450,000 a decrease of $105,000 from the FY 1986 request. The request provides necessary programmatic contract support for emergency planning activities including:

- o Support services for emergency preparedness exercise preparation/conduct and development of emergency management processes to augment in-house staff including test design, procedural development, simulation of emergency management concepts, and assistance in performing evaluation and follow-up. FY 1987 will continue efforts to improve Departmental emergency response management procedures, follow-up on lessons learned from previous major tests, and conduct of major exercises including the NATO WINTEX/CIMEX classified test. $200,000

- o Support is requested for classified energy security-related tasks. These classified tasks are a continuation of a major energy security-related activity, Project 87, begun in late FY 83. These funds would provide contract support in the area of modeling/simulation, analysis of technical issues associated with possible utilization of the Defense Production Act (i.e. estimation of economic sector level requirements for energy during mobilization), and programmatic contract support for in-house staff involved in complex analyses in coordination with the Department of Defense and the National Security Council. $250,000

EMERGENCY OPERATIONS FY 1987 ACTIVITIES

	FY 1985	FY 1986	FY 1987
Emergency Operations Operating Expenses	$ 766	$ 420	$ 368

The FY 1987 request for Emergency Operations is $368,000, a decrease of $52,000 over the FY 1986 request. The request provides necessary programmatic contract support as follows:

- o Funds are requested for automated data systems processing support currently provided to the Emergency Preparedness Program by EIA and other sources. Such services include technical support for various ADP equipment, specialized computer programming assistance for special classified projects and other data analytic functions, and data services. Additionally, funds are requested for microcomputer equipment maintenance services for ADP equipment provided to the Emergency Preparedness Program by EIA. The Emergency Preparedness Program has available a number of office systems (used for electronic mail communication, word processing, data processing with mainframe computer), a hard wired data processing terminal cluster utilized for basic data processing support with the mainframe computer, and portable terminals (used to augment the electronic mail system during exercises and in the event of emergency) which must be properly serviced to maintain assured operations. $213,000

- o Funds for maintaining the electronic mail communication system which supports DOE energy emergency preparedness public information activities with state and local governments, DOE Operations Offices and key elements of the private sector including the Department's Executive Reservists in energy emergencies. $70,000

- o Energy data base contractor support including commercial timesharing charges for commercial data sources, software upgrades, and hardware to support special classified projects and data analytic functions. $85,000

PROGRAM DIRECTION

	FY 1985	FY 1986	FY 1987
Emergency Preparedness	$4779	$4775	$5226
Staffing Total FTE	74	71	71

The FY 1987 request for Program Direction is $5,226,000 an increase of $451,000 over the FY 1986 request. The FY 1987 request would maintain the Emergency Preparedness program at 71 FTE. The FY 1987 request represents an increase in administrative overhead costs. These increases include rent, communications and inflationary adjustments associated with normal supplies and logistical services which are managed by the Department centrally. FY 1987 salary/benefit costs are estimated at $3,763,000 plus administrative overhead costs. Program Direction also includes official travel at $150,000 and computer support funding per OMB A-121.

This level of resources provides necessary and sufficient capabilities in the area of emergency planning for analyzing policy issues, solving practical energy emergency problems, and for updating response measures associated with energy supply emergencies. Additionally, this level of resources provides necessary and sufficient capabilities in the area of emergency operations for review and analysis of energy resources as they relate to emergency preparedness, and an emergency operations capability.

Emergency Preparedness staff at this level are responsible for development and evaluation of policy options/issues, formulation of emergency plans and procedures, development of risk assessments and situation analyses, energy supply system monitoring, conduct of emergency operations, data analysis/assessment/reporting, participation in tests/exercises, maintenance of defense preparedness, and analysis of SPR readiness status and use strategies along with the capability to perform the many "ad hoc" quick reaction projects to support DOE senior management and respond to Congressional requests.

Accordingly, the mix of programmatic elements demands a high degree of professional staff expertise. For example, the energy supply system vulnerability to sabotage and terrorism studies require background and analytical capabilities in energy systems engineering and operations, energy market analysis, refinery operations, power supply reliability and adequacy, natural gas pipeline transportation and operational systems analysis, and generic expertise on assessing strategic and tactical threats (e.g., effects of terrorism, natural disasters, mobilization/war). Our program staff have background and expertise in various energy security areas including analysis of defense energy requirements to support mobilization and wartime operations as well as fulfill NATO obligations, conduct of macroeconomic studies (modeling, gaming theory), and development/testing of complex scenarios to support work in defense-related issues (including Continuity of Government classified activities).

Another important area affecting our energy security involves support for International Energy Agency (IEA) programs including conduct of Allocation Simulation Tests, National Emergency Sharing Organization plans, and implementation of policy objectives for coordination of stock drawdown. Our staff has gained extensive experience in performing analysis of energy emergency impacts of international agreements (including legal issues that affect such components as the Voluntary Agreement and the Plan of Action for company participation in the IEA process, and the important relationship of the use of the Strategic Petroleum Reserve to support stock coordination policy objectives). Ongoing policy analysis, planning and operational capability build a substantial base of staff experience in understanding these complex annd often sensitive matters which impact on our national security.

A unique area of expertise resides in staff who develop and refine Departmental energy emergency management processes. These individuals (operations research analysts) utilize the energy emergency data systems and related analysis to support executive-level decision making requirements. Such skills rest heavily on involvement in our comprehensive program of tests, exercises and systematic evaluations. These activities require sensitivity to Departmental decision making dynamics.

The nature of this program demands the ability to periodically assess workloads and shift project priorities in accordance with changing world conditions. This means that the Emergency Preparedness Program relies heavily on utilization of task force groupings of professionals with unique technical expertise from various program elements to accomplish time sensitive complex tasks. Additionally the Emergency Preparedness program utilizes tests and exercises as a means for cross training of staff in emergency functions. This, of course, promotes a higher degree of preparedness through the training of staff in critical skills and functions.

KEY ACTIVITY SUMMARY

Actual Activities During FY 1985	Estimated Activities During FY 1986	Planned Activities During FY 1987
Emergency Preparedness Program Direction		
Develop and test various management systems to manage energy emergencies.	Establish a unified process (Energy Emergency Management System) for conducting Government preparation for and responses to a wide range of potential energy emergencies (including highly classified projects).	Enhance the Energy Emergency Management System by developing more diverse scenarios to which the Government can be prepared to respond; by conducting periodic exercises to test and refine its capabilities; and by augmenting associated analytical and decision support systems.
Conduct analyses to assess the vulnerability of energy systems to possible threats, including sabotage/terrorism.	Continuing analyses. Refinery vulnerability study completed.	Continuing analyses in response. to threat assessments.
Provide support for national emergency policies regarding Continuity of Government (COG) preparedness including planning, training for COG teams, participation in special classified projects and exercises. Administer the DOE Emergency Coordinator program.	Continuing.	Continuing.
Perform technical studies and provide expertise in support of NSC-mandated classified taskings, e.g., NSDD-134 and NSDD-188. Continue development of Defense Production Act plans and analyses of defense energy needs.	Perform technical studies and provide expertise in support of NSC-mandated classified defense energy taskings, e.g., NSDD-134 and NSDD-188. Develop Federal Resource Assistance System (FRAS). Continue DPA planning/analyses of defense energy needs.	Continuing.

KEY ACTIVITY SUMMARY

Actual Activities During FY 1985	Estimated Activities During FY 1986	Planned Activities During FY 1987
Manage NATO Wartime Oil Organization preparedness activities including planning, staffing, training for Joint Operations Staff functions.	Continuing	Continuing.
Continue technical support for IEA, NATO, other international energy agency activities. Do technical support and analysis of bilateral energy issues.	Continuing	Continuing.
Plan for IEA AST-5 and conduct NATO exercise. Provide representation and technical support for IEA SEQ.	Conduct AST-5. Plan for NATO WINTEX/CIMEX-87. Provide representation and technical support for IEA SEQ.	Follow-up on lessons learned from AST-5, other FY-86 exercises. Provide representation for IEA SEQ. Conduct WINTEX/CIMEX-87. Plan for AST-6.
Plan for and conduct classified exercises.	Plan for and conduct other periodic exercises. Conduct evaluation of exercises to ensure a systematic approach to "lessons learned".	Follow-up on lessons learned from exercises and perform evaluations of current exercises.
Conduct policy analyses of effective level of SPR fill, based on current oil market conditions, international situation, and fiscal conditions.	Continuing.	Continuing.
Initiate program design and development modifications in response to policy changes.	Continue modifications from new policy formulations; incorporate findings from FY-85 National Petroleum Council study on SPR use into SPR policy analyses.	Continue technical support to implement IEA coordinated stockdraw policy and analyze implications for SPR fill and use policy.

KEY ACTIVITY SUMMARY

Actual Activities During FY 1985	Estimated Activities During FY 1986	Planned Activities During FY 1987
Prepare for SPR test sale (mandated by EPCA).	Support conduct of SPR test sale, and monitor test to fully document results.	Follow up on procedure modifications from SPR test sale.
Provide energy situation impact/risk analysis in response to domestic/international events.	Continuing.	Continuing.
Refine, integrate and maintain specialized energy data bases to support emergency operations activities including support for several special classified projects.	Continuing.	Continuing.
Continue preparation of assessments/analyses of the vulnerability of the Nation's energy systems to actual or potential near-term disruptions.	Continuing.	Continuing.
Maintain operations readiness for energy emergency situations including ADP, reference, classified document control, Alert Coordination Officer system and logistics needs. Operate the emergency electronic mail system linking DOE with state energy offices, etc.	Continuing.	Continuing.

KEY ACTIVITY SUMMARY

Actual Activities During FY 1985	Estimated Activities During FY 1986	Planned Activities During FY 1987
Continue maintaining the DOE National Defense Executive Reserves by recruiting and training new members and integrating Reservists with regional emergency activities.	Continuing	Continuing.
Provide a public information capability for states, local governments and the general public as part of a Federal emergency response effort.	Continuing.	Continuing.
TOTAL: $4,779,000	TOTAL: $4,775,000	TOTAL: $5,226,000

KEY ACTIVITY SUMMARY

Actual Activities During FY 1985	Estimated Activities During FY 1986	Planned Activities During FY 1987
Emergency Planning Operating Expenses		
Support services for emergency preparedness tests and exercises, development of emergency management processes, test design, procedure development, situation analysis.	Same as for FY 1985.	Reflects completion of tasks begun in FY86 with more analysis being done by in-house staff.
Support for classified energy security tasks including modeling, simulation, analysis of technical issues		
TOTAL: $500,000	TOTAL: $555,000	TOTAL: $450,000
Emergency Operations Operating Expenses		
ADP support services provided by EIA, including equipment support, data analytic support, and special programming assistance.	Reflects decreased support service activity as data systems are developed.	Same as for FY 1986. Reflects system maintenance activities.
Energy data base contractor support, timesharing services, electronic mail.		
TOTAL: $766,000	TOTAL: $420,000	TOTAL: $368,000

DOE ENERGY EMERGENCY PREPAREDNESS PROGRAM DESCRIPTION
INTERNATIONAL AFFAIRS AND ENERGY EMERGENCIES

[1] DESCRIPTION

The following databases and computer systems are used by the Office of Energy Emergencies (OEE) to support emergency response activities:

Energy Situation Report (ESR)

Description: The ESR provides unique "real time" and near term quantitative and economic information concerning energy supplies, and other factors which affect the energy supply situation, e.g., weather, labor contracts, transportation, etc. The data covers both domestic and international energy supplies. The purpose of the ESR is to provide current information and allow DOE analysts to detect trends so as to anticipate possible energy supply problems such that appropriate analysis and response actions can be initiated. This database also provides current and recent historical data that could be used by analysts and decision makers in an energy emergency or in a national security emergency. Data is extracted from the ESR to prepare graphic charts on oil stocks, gasoline stocks, petroleum prices and petroleum movements.

Status: The ESR is normally maintained on the Energy Information Administration's EIA mainframe computer. However, it can be down loaded to a micro computer and then maintained or a new ESR can be prepared on the micro computer. Most graphics are limited to the EIA main frame.

Energy Facility Locator System (EFLS)

Description: The EFLS is a micro computer based (D Base 3) data base that contains information on the physical location by county and zip code and some major characteristics of various types of key energy facilities, e.g., electric generating stations, oil refineries, natural gas underground storage, electric power system control centers and DOE facilities. Preparations have been made for the addition of other energy facilities such as electric power substations, electric transmission lines, oil and gas pipelines to this system. This system supports analysts and decision makers during national security emergencies and was developed in support of special access classified Continuity of Government programs. The system could also be used to support analyses during potential or actual energy emergencies.

Status: The EFLS system has been developed by the OEE staff with contractor assistance and is complete in its initial form. The current effort is directed towards external hard disk acquisition to provide adequate machine capability and identifying and loading additional energy facility data to make the system fully operational.

Decision Support System (DSS)

Description: The DSS is a micro computer based (Lotus) series of programs that provide analytic output in a form that can be readily used by management to analyze options and recommend decisions during an energy emergency. It is intended to provide graphic outputs, reference lists, lists of options, and steps necessary to implement a decision.

Status: The current system has been developed by a contractor and in-house staff. The present system can supply graphic outputs, etc., in support of decision makers during a petroleum supply disruption with some limited capability to support decision makers during other types of energy emergencies. OEE now plans to utilize a contractor to enhance the data management capability of this system and to make the DSS an integrating system for other databases and systems that support emergency operations, e.g., Energy Situation Report (ESR), Energy Facility Locator System (EFLS), etc.

Reference Locator System (RLS)

Description: The RLS is a microcomputer based system developed by OEE staff to keep track of the reference materials that are available in the Response Coordination Center (RCC), the Emergency Operations Center, and the various Continuity of Government (COG) relocation sites. This system allows the members of the COG teams to ensure that the materials they will need during a national security emergency are pre-positioned and kept current. It also allows the user to quickly locate references that may be of use during an emergency.

Status: The basic system is operational with current efforts directed towards inputting the data on all the various reference materials. Some refinements and enhancements may be made at a later date after more experience is gained in using the system. The system is being used to maintain reference materials at 4 operating locations including a NATO facility supported by DOE.

Message Logging System (MLS)

Description: The MLS is a microcomputer based system developed by OEEO staff to log messages received during tests and exercises or during actual emergencies. The system allows tracking of action items, and checking for adequate message description as well as an efficient means of keeping everyone, especially management, informed as to the message traffic.

Status: The system was used during AST-5 and Rex 86 Alpha. Some refinements have been made based on the experience gained. It is now fully operational.

Executive Reserve Information System (ERIS)

Description: The ERIS is used to keep track of information concerning the members of DOE's three National Defense Executive Reserve (NDER) units. It provides information on the status of the NDER member's security clearance, areas of expertise, employer, mailing address, normal and emergency phone numbers, etc.

Status: The system is based on a number of IBM Displaywriter databases and is currently used extensively in the day-to-day administration of the NDER units. Future plans call for moving this system to a micro computer to allow more efficient and quicker operation and upkeep of the system.

Voluntary Offer Tracking System (VOTS)

Description: The VOTS is a microcomputer based system developed by OEE staff to record, verify, and track the status of non-reporting company voluntary offers to share oil supplies during a shortfall. During activation of the International Energy Agency's (IEA) Sharing System or tests of this system, the DOE is responsible, among other duties for soliciting, verifying, and transmitting these offers to the IEA.

Status: This system was utilized in AST-5 with positive results.

Literature Search System (LSS)

Description: The LSS is designed to keep track of the reference material on energy system vulnerability. This includes books, periodicals, notes, phone conversations, meeting minutes, etc. The LSS allows retrieval by keywords, as well as other criteria, such that relevant literature can be quickly identified for personnel doing studies or answering questions in this area. The system is generically designed to allow it to be used to track reference material in other areas.

Status: The LSS in operational on the EIA mainframe computer. Data preparation and entry are performed using IBM Displaywriters. A number of improvements and enhancements have been identified to make the system more efficient and effective.

[2] AUTHORITY

Management initiative. All of these systems are based on data collected by EIA, other offices/agencies, and commercial databases. No data reporting requirements have been levied by OEE to support these systems.

[3] ACTIVATION AND USE

These ongoing systems. See the individual descriptions for the status.

[4] RESPONSIBILITIES

These systems are maintained by the Office of Energy Emergencies.

DEPARTMENT OF ENERGY
INTERNATIONAL AFFAIRS AND ENERGY EMERGENCIES
OBJECT CLASSIFICATION
(In Thousands of Dollars)

Budget line item: Emergency Preparedness

89-0234-0-1-274		1985 Actual	1986 Estimate	1987 Estimate
	Personnel Compensation:			
11.1	Permanent positions.	$3,432	$3,224	$3,331
11.3	Other than full-time permanent . . .	68	60	70
11.5	Other personnel compensation	41	40	40
	Total personnel compensation	$3,541	$3,324	$3,441
	Personnel Benefits:			
12.1	Civilian	$ 346	$ 330	$ 323
21.0	Travel and transportation of persons.	150	150	150
22.0	Transportation of things	18	40	20
23.2	Communications, utilities, and other rent	554	613	711
24.0	Printing and reproduction.	56	52	62
25.0	Other services	1,323	1,181	1,263
26.0	Supplies and materials	57	60	74
	Total obligations.	$6,045	$5,750	$6,044

DEPARTMENT OF ENERGY

FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST

ENERGY REGULATION

VOLUME 7

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DEPARTMENT OF ENERGY

Proposed Appropriated Language

Economic Regulation

For necessary expenses in carrying out the activities of the Economic Regulatory Administration and the Office of Hearings and Appeals, [$24,623,000] $21,850,000. (Department of the Interior and Related Agencies Appropriations Act, 1986, as included in Public Law 99-190.)

DEPARTMENT OF ENERGY

FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF ESTIMATES BY APPROPRIATION BY MAJOR ACTIVITY

ENERGY REGULATION

BUDGET AUTHORITY IN THOUSANDS OF DOLLARS

	FY 1985 Actual	FY 1986 Estimate	FY 1987 Request
Fuels Conversion	$ 1,273	$ 1,142	---
Compliance	17,442	14,281	13,685
Petroleum Operations	2,041	2,079	2,060
Program Administration	1,141	646	1,105
Office of Hearings and Appeals	5,242	5,275	5,000
Total, Energy Regulation	$27,139	$23,423	$21,850

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
PROGRAM OVERVIEW

ECONOMIC REGULATORY ADMINISTRATION

In FY 1987, the Economic Regulatory Administration (ERA) program goals include the resolution of remaining enforcement cases involving alleged violations of the Emergency Petroleum Allocation Act of 1973 (EPAA); the authorization of natural gas imports and exports; and the authorization of electricity exports and construction and operation of electric transmission facilities at international borders.

During FY 1986, the following objectives are projected to be met:

- Completion of the review and analysis of all audits and the issuance of Proposed Remedial Orders (PRO) to those firms with alleged pricing violations.
- Litigation of alleged EPAA violations in administrative and judicial forums in approximately 400 cases.
- Negotiating settlements of unresolved enforcement matters with approximately 45-65 firms, including 3 major refiners.
- Processing of 27 natural gas import applications.
- Processing of 4 electricity export applications and 6 facility construction permits.
- Issuance of 7 final powerplant conversion orders to electric utilities and processing of 70 exemption requests.

During FY 1987, the following objectives are targeted:

- Continue administrative and judicial litigation of unresolved EPAA enforcement matters, projected to involve approximately 275 firms.
- Negotiate settlements with as many firms as possible with unresolved enforcement matters.
- Continuation of the natural gas and electricity program activities.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE
OPERATING EXPENSES
ECONOMIC REGULATORY ADMINISTRATION
(Dollars in thousands)

	FY 1985 Appropriation	FY 1986	FY 1987 Base	FY 1987 Request	Request vs Base
Compliance.....	$17,442 1/	$14,281	$14,281	$13,685	- 596
Fuels Conversion.....	1,273	1,142	1,142	0	-1,142
Natural Gas and Electricity Operations.	2,041	2,079	2,079	2,060	- 19
Program Administration...	1,141	646	646	1,105	+ 459
Total Operating Expenses.	$21,897	$18,148	$18,148	$16,850	-1,298
Staffing Total FTEs.....	295	250	250	206	- 44

1/ Comparability adjustment for transfer-in of Office of General Counsel Enforcement personnel is $2,499.

Authorization: P.L. 92-210, P.L. 93-159, P.L. 93-275, P.L. 93-319, P.L. 94-99, P.L. 94-163, P.L. 94-385, P.L. 95-91, P.L. 95-617, P.L. 95-619, P.L. 95-620, P.L. 95-621, P.L. 66-280

The Economic Regulatory Administration operates its programs under the authority of several sections of the aforementioned public laws.

Department of Energy

FY 1987 Congressional Budget Request

Adjustments to FY 1986 Appropriations

	FY 1986 Conference	General Reduction	Gramm-Rudman-Hollings Reduction	Adj. Approp. Total
Economic Regulatory Administration				
Compliance	$ 15,012	$ -90	$ -641	$14,281
Natural Gas and Electricity Operations	2,186	-13	-94	2,079
Fuels Conversion	1,200	-7	-51	1,142
Program Administration	680	-5	-29	646
Subtotal, Economic Regulatory Administration	$ 19,078	$ -115	$ -815	$18,148
General Reduction	-115	+115		
Total, Economic Regulatory Administration	$ 18,963	$ --	$ -815	$18,148

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF CHANGES
ECONOMIC REGULATORY ADMINISTRATION
(Dollars in thousands)

FY 1986/FY 1987 Base	$18,148
Program Increases and Decreases:	
o Reduction in Compliance program caseload in FY 1987	- 896
o Increase in severance cost for Compliance personnel	+ 300
o Termination of Fuels Conversion program	- 1,142
o Increase in severance cost in Program Administration	+ 450
o Net decrease in other program costs	- 10
FY 1987 Budget Request	$16,850

NARRATIVE JUSTIFICATION

	FY 1986	FY 1987 Request
Compliance.....	$14,281	$13,685

The FY 1987 budget request is $13,685,000, a decrease of $596,000 from FY 1986. This decrease is attributable to a reduction in the program's caseload, offset by costs associated with expected personnel reductions.

The Compliance program is responsible for all program activities related to the enforcement of the petroleum pricing and allocation regulations issued under the EPAA. During FY 1987, enforcement of the program will be dedicated to the litigation of approximately 275 cases estimated to be still active either in administrative litigation before the Department's Office of Hearings and Appeals (OHA) and the Federal Energy Regulatory Commission (FERC) or in judicial litigation before the federal courts. These cases stem from audits conducted of major oil company and other petroleum firms from the period of price controls through mid-fiscal year 1986.

The program objectives in FY 1987 are to litigate all pending cases, with the goal of achieving resolution through court decisions or negotiated settlements on a third to half of the case inventory. The completion of all program audit work will permit the complete attention of all audit and paralegal personnel to the task of litigation support. By virtue of this dedication of resources to case resolution, the conduct of litigation and settlements will be performed with maximum effectiveness. These remaining cases are expected to result in as much as $2.5 billion in recoveries.

Because of the value of these pending cases, it is necessary to maintain a staff of experienced attorneys and highly specialized support personnel, including auditors, paralegals, and computer technicians to handle the large workload in a responsible manner. This staff will continue to face talented and skilled litigation opponents used by the petroleum firms in contesting the government's cases. During FY 1987, it is anticipated that a number of these cases will enter crucial litigation phases, and the enforcement staff must be sufficiently experienced and funded to properly represent the interests of the Department on behalf of the public.

Settlement of cases in litigation will continue to be the Department's preferred method of case resolution, in instances where negotiated agreements can be reached consistent with the public interest. However, experience has demonstrated that successful settlement activity is enhanced by purposeful and skilled litigation.

Compliance (continued)

A portion of the staff will be devoted to monitor post-resolution compliance with final enforcement orders, including the pursuit of companies found to be delinquent in payments to the DOE escrow fund. Staff is also needed to provide assistance to OHA in identifying customers whose injury from overcharges entitles them to restitution from funds collected by DOE.

As a result of the dedicated litigation and settlement activity planned during the year, the inventory of remaining cases is estimated to be reduced substantially by the end of FY 1987, perhaps to 100-175 cases.

The FTE allowance for Compliance is 170. Of these, approximately 150 will be utilized for litigation and litigation support (including approximately 75 attorneys), 15 for non-litigation program activities, including audits and compliance monitoring, and 5 for management. This personnel level provides one attorney for approximately four cases--a ratio more than adequate for effective program management.

The budget request includes $8,345,000 for salaries and benefits, $400,000 for travel, $3,340,000 for overhead costs, $1,300,000 for contracted litigation support services, and $300,000 for severance costs for field personnel.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
ECONOMIC REGULATORY ADMINISTRATION

KEY ACTIVITY SUMMARY
COMPLIANCE

Key Activity	Actual Activities During FY 1985	Estimated Activities During FY 1986	Planned Activities During FY 1987
Litigation	Conducted judicial and administrative litigation in approximately 475 cases. Negotiated settlements with 53 firms to resolve outstanding cases. ($13.2 million, including $1.5 million for contracts for litigation support).	Conduct judicial and administrative litigation in approximately 400 cases. Negotiate settlements with as many firms as possible (targeted at 45-65 firms). ($12.4 million, including $1.4 million for contracts for litigation support).	Conduct judicial and administrative litigation in approximately 275 cases. Negotiate settlements with as many firms as possible (targeted at 30-60 firms). ($12.2 million, including $1.3 million for contracts for litigation support).
Non-Litigation	Completed audits and issue PROs to 50 firms. Completed investigations of cases where willfull violations are suspected and refer approximately 18 such cases to DOJ. Monitor compliance with approximately 300 final remedial and consent orders and institute enforcement action in federal district court where non-compliance has occurred. ($3.8 million).	Complete audits of all remaining firms and issue PROs as appropriate. As requested by DOJ, provide support for prosecutions of willful violation cases. Monitor compliance with approximately 200 final orders and take enforcement action, as appropriate. ($1.5 million).	Monitor compliance with approximately 150 final orders and take enforcement action, as appropriate. ($1.1 million).
Management	Provide overall program and policy direction to enforcement activities. ($0.4 million).	Provide overall program and policy direction to enforcement activities. ($0.4 million).	Provide overall program and policy direction to enforcement activities. ($0.4 million).

NARRATIVE JUSTIFICATION

	FY 1986	FY 1987 Request
Fuels Conversion.....	$ 1,142	$ 0

The FY 1987 budget request does not include funding for the Fuels Conversion program and is premised upon repeal of the Powerplant and Industrial Fuel Use Act prior to FY 1987.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
ECONOMIC REGULATORY ADMINISTRATION

KEY ACTIVITY SUMMARY
FUELS CONVERSION

Key Activity	Actual Activities During FY 1985	Estimated Activities During FY 1986	Planned Activities During FY 1987
Fuels Conversion Program	Issued 3 final conversion orders and processed 70 exemption requests; monitored achievement of utility natural gas conservation programs; reported to Congress. ($1.3 million).	Issue 7 final conversion orders and process 70 exemption requests; monitor achievement of utility natural gas conservation programs; report to Congress. ($1.1 million).	None, premised upon repeal of the Powerplant and Industrial Fuel Use Act prior to FY 1987.

NARRATIVE JUSTIFICATION

	FY 1986	FY 1987 Request
Natural Gas and Electricity Operations	$ 2,079	$ 2,060

The FY 1987 budget request is $2,060,000, a decrease of $19,000 from FY 1986.

The goals of the Natural Gas and Electricity Operations activities are to manage the regulatory review of natural gas imports, and to authorize exports of electricity and construction and operation of electric power transmission facilities at international borders, consistent with the public interest.

The natural gas activity is authorized and required by Section 3 of the Natural Gas Act, Titles III and IV of the Natural Gas Policy Act, and Sections 402, 403 and 405 of the DOE Organization Act. Applications to import and export natural gas are evaluated and approved when in the public interest. The Department of Energy's policy is to approve import/export arrangements that are buyer-seller negotiated and that provide supplemental supplies of gas at market-competitive prices. In FY 1986, the agency plans to complete proceedings and issue orders on 27 of 56 import applications. The FY 1987 workload is projected to include 19 new applications along with 22 carried over from FY 1986 -- for a caseload of 41. The number of cases remains at this level because of the increased number of import applications for spot and short-term sales anticipated as market competition increases. The agency will also continue to provide technical support for international consultations on natural gas trade. The natural gas activity will require 21 FTEs for FY 1987.

The electricity import/export activity is authorized and required by Section 202(e) and (f) of the Federal Power Act and Executive Order 10485. Applications to export electricity are assessed for impact on sufficiency of the U.S. electric power supply, and facility permit applications are reviewed for environmental and system reliability consequences. During FY 1986, four electricity exports are expected to be authorized and six permits for facility construction processed one of which will be fully completed. While the number of cases is expected to remain the same for FY 1987, it is anticipated that they will be more complex with larger volumes and physical structures involved. Some increase in generic analytical activity is also anticipated as import volumes increase. The agency will continue to monitor and analyze electricity import/export activity and publish an annual report on the exchanges that take place. Technical and analytical support will also be provided for bilateral discussions on electricity trade. The electricity activity will require five FTEs as well as $250,000 in contract support for FY 1987. Contract funds will be used primarily for environmental impact studies to comply with the National Environmental Policy Act; some contract funds will be used for reliability and other studies, mostly in support of the licensing activity.

In addition to the contract support, the request includes $1,285,000 for salaries and benefits, $10,000 for travel, and $515,000 for overhead costs. The 26 FTE allowance is approximately the same personnel level as provided in FY 1986 and is consistent with the projected workload.

DEPARTMENT OF ENERGY
FY 1986 CONGRESSIONAL BUDGET REQUEST
ECONOMIC REGULATORY ADMINISTRATION

KEY ACTIVITY SUMMARY
NATURAL GAS AND ELECTRICITY OPERATIONS

Key Activity	Actual Activities During FY 1985	Estimated Activities During FY 1986	Planned Activities During FY 1987
Natural Gas Program	Processed 34 import applications; provided technical support for consultations with U. S. trading partners; participate in FERC proceedings. ($1.5 million, including $0.3 million for contracts for environmental impact statements and reliability assessments).	Process 27 import applications; provide technical support for consultations with U. S. trading partners; participate in FERC proceedings. ($1.5 million, including $0.3 million for contracts for environmental impact statements and reliability assessments).	Process 33 import applications; provide technical support for consultations with U. S. trading partners; participate in FERC proceedings. ($1.5 million, including $0.3 million for contracts for environmental impact statements and reliability assessments).
Electricity Program	Process 3 electricity export applications and 3 facility construction permits. ($0.6 million).	Process 4 electricity export applications and 6 facility construction permits. ($0.6 million).	Process 4 electricity export applications and 5 facility construction permits. ($0.6 million).

NARRATIVE JUSTIFICATION

	FY 1986	FY 1987 Request
Program Administration	$ 646	$ 1,105

The FY 1987 budget request is $1,105,000, an increase of $459,000 over FY 1986. This increase is attributable to costs associated with expected personnel reductions.

The goal of this activity is to provide management and administrative support for ERA programs. The major objectives are to assure proper administration and management of the Natural Gas and Electricity Operations and Compliance programs and to provide personnel, travel, budget, and other administrative support. This activity currently includes the Office of the Administrator and the Office of Administration and Financial Management.

In FY 1987, the Program Administration staff will process and maintain personnel and organizational documents; prepare budget submissions and expenditure reports; allocate and monitor all aspects of budget execution; coordinate regional personnel and funding actions; control and respond to Congressional and public correspondence, and; act as liaison with various administrative and financial offices within the Department.

The FY 1987 request provides for pay and benefit costs of $495,000 for 10 FTEs, $15,000 for travel, $145,000 for overhead costs, and $450,000 for severance costs for headquarters personnel.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
OBJECT CLASS
FY 1987 BASE AND FY 1987 ESTIMATE
ECONOMIC REGULATORY ADMINISTRATION

COMPLIANCE

		FY 1987 Base		FY 1987 Estimate		Increase (+) or Decrease (-)	
		FTE	Amount	FTE	Amount	FTE	Amount
Direct Obligations:							
11.0	Personnel compensation						
11.1	Full-time permanent.....		8,375		7,470		- 905
11.5	Other personnnel compensation..		60		50		- 10
11.9	Total personnel compensation...	200	8,435	170	7,520	-30	- 915
12.1	Personnel benefits.....		931		825		- 106
13.0	Benefits to former personnel.....		0		300		+ 300
21.1	Travel and transportation persons		400		400		0
22.0	Transportation of things.....		60		50		- 10
23.0	Communications, utilities, rents.		2,200		2,500		+ 300
24.0	Printing and reproduction		205		210		+ 5
25.0	Other.....		1,925		1,750		- 175
26.0	Supplies and materials		125		130		+ 5
	Total direct obligations....	200	14,281	170	13,685	-30	- 596

NOTE: The object class distribution reflects the allocation of resources presented in the fiscal 1987 congressional justification. Some estimates may differ from those shown in the budget appendix due to technical adjustments made subsequent to the submission of the appendix.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
OBJECT CLASS
FY 1987 BASE AND FY 1987 ESTIMATE
ECONOMIC REGULATORY ADMINISTRATION

FUELS CONVERSION

		FY 1987 Base		FY 1987 Estimate		Increase (+) or Decrease (-)	
		FTE	Amount	FTE	Amount	FTE	Amount
Direct Obligations:							
11.0	Personnel compensation						
11.1	Full-time permanent.....		580		0		- 580
11.5	Other personnnel compensation..		15		0		- 15
11.9	Total personnel compensation...	12	595	0	0	-12	- 595
12.1	Personnel benefits.....		70		0		- 70
21.1	Travel and transportation persons		12		0		- 12
23.0	Communications, utilities, rents.		195		0		- 195
24.0	Printing and reproduction		10		0		- 10
25.0	Other.....		250		0		- 25
26.0	Supplies and materials		10		0		- 10
	Total direct obligations....	12	1,142	0	0	-12	-1,142

NOTE: The object class distribution reflects the allocation of resources presented in the fiscal 1987 congressional justification. Some estimates may differ from those shown in the budget appendix due to technical adjustments made subsequent to the submission of the appendix.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
OBJECT CLASS
FY 1987 BASE AND FY 1987 ESTIMATE
ECONOMIC REGULATORY ADMINISTRATION

NATURAL GAS AND ELECTRICITY OPERATIONS

		FY 1987 Base		FY 1987 Estimate		Increase (+) or Decrease (-)	
		FTE	Amount	FTE	Amount	FTE	Amount
Direct Obligations:							
11.0	Personnel compensation						
11.1	Full-time permanent.....		1,200		1,150		- 50
11.5	Other personnnel compensation..		10		10		0
11.9	Total personnel compensation...	28	1,210	26	1,160	-2	- 50
12.1	Personnel benefits.....		134		125		- 9
21.1	Travel and transportation persons		10		10		0
23.0	Communications, utilities, rents.		350		385		+ 35
24.0	Printing and reproduction		33		35		+ 2
25.0	Other.....		320		320		0
26.0	Supplies and materials		22		25		+ 3
	Total direct obligations....	28	2,079	26	2,060	-2	- 19

NOTE: The object class distribution reflects the allocation of resources presented in the fiscal 1987 congressional justification. Some estimates may differ from those shown in the budget appendix due to technical adjustments made subsequent to the submission of the appendix.

FY 1987 CONGRESSIONAL BUDGET REQUEST
OBJECT CLASS
FY 1987 BASE AND FY 1987 ESTIMATE
ECONOMIC REGULATORY ADMINISTRATION

PROGRAM ADMINISTRATION

		FY 1987 Base		FY 1987 Estimate		Increase (+) or Decrease (-)	
		FTE	Amount	FTE	Amount	FTE	Amount
Direct Obligations:							
11.0	Personnel compensation						
11.1	Full-time permanent.....		433		438		+ 5
11.5	Other personnnel compensation..		8		8		0
11.9	Total personnel compensation...	10	441	10	446	0	+ 5
12.1	Personnel benefits.....		48		49		+ 1
13.0	Benefits for former employees....		0		450		+ 450
21.1	Travel and transportation persons		20		15		- 5
23.0	Communications, utilities, rents.		105		112		+ 7
24.0	Printing and reproduction		8		9		+ 1
25.0	Other.....		15		15		0
26.0	Supplies and materials		9		10		0
	Total direct obligations....	10	646	10	1,105	0	+ 459

NOTE: The object class distribution reflects the allocation of resources presented in the fiscal 1987 congressional justification. Some estimates may differ from those shown in the budget appendix due to technical adjustments made subsequent to the submission of the appendix.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
OBJECT CLASS
FISCAL YEARS 1985 THROUGH 1987
ECONOMIC REGULATORY ADMINISTRATION

COMPLIANCE

		FY 1985 Actual	FY 1986 Estimate	FY 1987 Estimate
Direct Obligations:				
11.0	Personnel compensation			
11.1	Full-time permanent.....	10,478	8,375	7,470
11.5	Other personnel compensation.....	84	60	50
11.9	Total personnel compensation.....	10,562	8,435	7,520
12.1	Personnel benefits.....	1,146	931	825
13.0	Benefits to former personnel.....	0	0	300
21.1	Travel and transportation of persons.	424	400	400
22.0	Transportation of things.....	61	60	50
23.0	Communications, utilities, and rents.	2,657	2,200	2,500
24.0	Printing and reproduction.....	183	205	210
25.0	Other.....	2,292	1,925	1,750
26.0	Supplies and materials.....	117	125	130
	Total direct obligations.....	17,442	14,281	13,685

NOTE: The object class distribution reflects the allocation of resources presented in the fiscal 1987 congressional justification. Some estimates may differ from those shown in the budget appendix due to technical adjustments made subsequent to the submission of the appendix.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
OBJECT CLASS
FISCAL YEARS 1985 THROUGH 1987
ECONOMIC REGULATORY ADMINISTRATION

FUELS CONVERSION

		FY 1985 Actual	FY 1986 Estimate	FY 1987 Estimate
Direct Obligations:				
11.0	Personnel compensation			
11.1	Full-time permanent.....	688	580	0
11.5	Other personnel compensation.....	21	15	0
11.9	Total personnel compensation.....	709	595	0
12.1	Personnel benefits.....	79	70	0
21.1	Travel and transportation of persons..	12	12	0
23.0	Communications, utilities, and rents..	171	195	0
24.0	Printing and reproduction.....	8	10	0
25.0	Other.....	286	250	0
26.0	Supplies and materials.....	8	10	0
	Total direct obligations.....	1,273	1,142	0

NOTE: The object class distribution reflects the allocation of resources presented in the fiscal 1987 congressional justification. Some estimates may differ from those shown in the budget appendix due to technical adjustments made subsequent to the submission of the appendix.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
OBJECT CLASS
FISCAL YEARS 1985 THROUGH 1987
ECONOMIC REGULATORY ADMINISTRATION

NATURAL GAS AND ELECTRICITY OPERATIONS

		FY 1985 Actual	FY 1986 Estimate	FY 1987 Estimate
Direct Obligations:				
11.0	Personnel compensation			
11.1	Full-time permanent	1,129	1,200	1,150
11.5	Other personnel compensation	9	10	10
11.9	Total personnel compensation	1,138	1,210	1,160
12.1	Personnel benefits	126	134	125
21.1	Travel and transportation of persons	11	10	10
23.0	Communications, utilities, and rents	334	350	385
24.0	Printing and reproduction	26	33	35
25.0	Other	388	320	320
26.0	Supplies and materials	18	22	25
	Total direct obligations	2,041	2,079	2,060

NOTE: The object class distribution reflects the allocation of resources presented in the fiscal 1987 congressional justification. Some estimates may differ from those shown in the budget appendix due to technical adjustments made subsequent to the submission of the appendix.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
OBJECT CLASS
FISCAL YEARS 1985 THROUGH 1987
ECONOMIC REGULATORY ADMINISTRATION

PROGRAM ADMINISTRATION

		FY 1985 Actual	FY 1986 Estimate	FY 1987 Estimate
Direct Obligations:				
11.0	Personnel compensation			
11.1	Full-time permanent.....	466	433	438
11.5	Other personnel compensation.....	8	8	8
11.9	Total personnel compensation.....	474	441	446
12.1	Personnel benefits.....	52	48	49
13.0	Benefits to former personnel.....	457	0	450
21.1	Travel and transportation of persons.	21	20	15
23.0	Communications, utilities, and rents.	101	105	112
24.0	Printing and reproduction.....	7	8	9
25.0	Other.....	21	15	15
26.0	Supplies and materials.....	8	9	10
	Total direct obligations.....	1,141	646	1,105

NOTE: The object class distribution reflects the allocation of resources presented in the fiscal 1987 congressional justification. Some estimates may differ from those shown in the budget appendix due to technical adjustments made subsequent to the submission of the appendix.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
FY 1987 CONTRACT LISTING
ECONOMIC REGULATORY ADMINISTRATION
(in thousands of dollars)

	Estimated Amount
Compliance	
Litigation support, including document discovery, indexing, filing, research, analysis, and data base development	$ 1,300
Natural Gas and Electricity Operation	
Preparation of environmental impact statements and reliability assessments for proposed electric transmission facilities crossing international borders	250

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF SUPPORT REQUIRED FROM EIA
ECONOMIC REGULATORY ADMINISTRATION
(in thousands of dollars)

	FY 1985	FY 1986	FY 1987
Compliance			
Case tracking and audit support.....	0	$ 210	$ 210

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
APPROPRIATIONS/FTEs/ACCOMPLISHMENTS FY 1985 THRU FY 1987
ECONOMIC REGULATORY ADMINISTRATION
(Dollar amounts in thousands)

	Actual FY 1985	Est. FY 1986	Est. FY 1987
Compliance			
o Appropriation	$17,442	$14,281	$13,685
o Full-time Equivalents	242	200	170
o Major Refiner PROs Issued	16	1-3	0
o Non-Major Refiner PROs Issued	42	10-20	0
o Negotiated Settlements (Firms)	53	45-65	30-60
o Administrative Litigation (Cases)	275	225	150
o Judicial Litigation (Cases)	200	175	125
o Special Investigation Referrals to DOJ.	18	0	0
o Monitor Remedial and Consent Orders	300	200	150
Fuels Conversion			
o Appropriation	$ 1,273	$ 1,142	$ 0 1/
o Full-time Equivalents	15	12	0 1/
o Prohibition Orders Completed	3	7	0 1/
o Exemptions Processed	70	70	0 1/
Natural Gas and Electricity Operations			
o Appropriation	$ 2,041	$ 2,079	$ 2,060
o Full-time Equivalents	27	28	26
o Gas Import Applications Completed	34	27	33
o Electricity Export Applications	3	4	4
o Presidential Permits Processed	3	6	5
Program Administration			
o Appropriation	$ 1,141	$ 646	$ 1,105
o Full-time Equivalents	11	10	10
Total Appropriation	$21,897	$18,148	$16,850
Total Full-time Equivalents	295	250	206

1/ Assumes repeal of the prohibitions in the Fuel Use Act on the use of oil and gas in new powerplants and industrial facilities by year end FY 1986.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
PROGRAM OVERVIEW

OFFICE OF HEARINGS AND APPEALS

The goal of the Office is to promote the lawful and equitable operation of the DOE programs by expeditiously processing and resolving petitions for regulatory or other relief. The Office is responsible for all of the Department's adjudicatory processes -- other than those administered by the Federal Energy Regulatory Commission or the Board of Contract Appeals -- and therefore reviews and decides exception applications from individual firms or persons who believe that a DOE-issued rule, regulation, or order causes a serious hardship, gross inequity, or an unfair distribution of burdens. The Office is also responsible for deciding final appeals in adjudicatory matters under the jurisdiction of the Secretary and for providing an adjudicatory forum in enforcement matters to consider contested issues of fact and law prior to the issuance of a Remedial Order. Additionally, the Office is increasingly involved in administering refund proceedings governed by the DOE regulations at 10 C.F.R. Part 205, Subpart V. A refund proceeding is initiated by the filing by ERA of a Subpart V petition, which requests OHA to establish procedures for the distribution to injured parties of funds obtained as a result of petroleum enforcement and settlement actions.

FY 1986 projected accomplishments:

- Resolve 156 compliance and related cases and 298 non-compliance filings.
- Continue to formulate and implement procedures and standards governing Subpart V overcharge refund proceedings.
- Process refund applications and distribute funds involved in existing Subpart V proceedings.

Specific objectives for FY 1987 to 1990, formulated in response to Public Laws, are:

- Complete and close all compliance matters expeditiously.
- OHA estimates that during each year beginning with FY 1986 it may receive between 400 and 700 petitions related to the Freedom of Information Act, the Privacy Act, the information requirements of the Energy Information

Administration, and petitions for private grievance or redress. The bulk of these submissions is subject to processing time limitations and other requirements which specify priority treatment.

OHA anticipates that it may be asked in FY 1987 to administer refund proceedings involving the distribution of between $1,400,000,000 and $3,700,000,000 in additional monies obtained as a result of petroleum enforcement and settlement actions. The distribution of these refund monies, however, and the processing of a projected 175,000 to 200,000 applications, is subject to the outcome of court decisions in pending DOE enforcement actions and possible legislation.

Accomplishment of these objectives will help provide for the termination of matters pertaining to the prior DOE regulatory programs. It also will provide for the resolution of complex issues involving the distribution of large sums of money among claimants who include energy producers, consumers, the U.S. government and other governmental entities.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE

OFFICE OF HEARINGS AND APPEALS - OPERATING EXPENSES
(Tabular dollars in thousands. Narrative material in whole dollars.)

	FY 1985 Appropriation	FY 1986 Adjusted	FY 1987 Base	FY 1987 Request	Request vs Base
Total:					
Operating Expenses:	$5,242	$5,275	$5,275	$5,000	$-275
Staffing (Total FTE):	82 1/	90	90	84	- 6

AUTHORIZATIONS: Sections 503, 504(a), P.L. 95-91; Section 21, P.L. 93-275; Section 104, P.L. 94-385; Section 5, P.L. 93-159; Section 207, P.L. 92-210; P.L. 89-554; P.L. 93-579.

1/ Reflects actual FTE usage in FY 1985.

Department of Energy

FY 1987 Congressional Budget Request

Adjustments to FY 1986 Appropriations

	FY 1986 Conference	General Reduction	Gramm-Rudman-Hollings Reduction	Adj. Approp. Total
Office of Hearings and Appeals				
Hearings and Appeals	$5,545	$ -33	$ -237	$5,275
Subtotal, Office of Hearings and Appeals	5,545	-33	-237	5,275
General Reduction	-33	+33	--	--
Total, Office of Hearings and Appeals	$5,512	$ --	$ -237	$5,275

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF CHANGES
(in thousands of dollars)

OFFICE OF HEARINGS AND APPEALS

FY 1986	$5,275
Built in increases and decreases	0
FY 1987 base	5,275
Program increases and decreases:	
Reduction in staffing level	-275
FY 1987 Budget Request	$5,000

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
NARRATIVE JUSTIFICATION

OFFICE OF HEARINGS AND APPEALS

The FY 1987 budget request is for $5,000,000, which represents a $275,000 decrease from the adjusted appropriation for FY 1986. This request will provide for salaries and support for 84 full-time staff year equivalents (FTE), a decrease of ten FTE from FY 1985 staffing levels and six FTE from FY 1986 staffing levels. At this level of funding OHA believes that it will have sufficient resources to (1) adjudicate the compliance and related enforcement cases which commence when the Economic Regulatory Administration (ERA) issues a Proposed Remedial Order, (2) review and decide exception applications from individual firms or persons who believe that a DOE-issued rule, regulation, or order causes a serious hardship, gross inequity, or an unfair distribution of burdens, and (3) entertain final appeals in adjudicatory matters under the jurisdiction of the Secretary of Energy. During FY 1987, in addition to the above responsibilities, we will continue processing applications for refunds filed in proceedings instituted under Subpart V of the Department's procedural Regulations. As of year-end FY 1985, OHA had considered and resolved more than 14,760 of the approximately 17,450 applications for refund filed and, as a result, distributed refunds totalling over $77,000,000. Approximately $1,300,000,000 in refunds was awaiting distribution in existing Subpart V proceedings at that time.

On the basis of ERA projections of compliance and enforcement activity for FY 1986 and FY 1987, OHA projects receiving 120 new compliance-related petitions in FY 1986 and approximately 60 new compliance-related petitions in FY 1987. These enforcement and compliance-related cases raise many novel legal issues and represent the most complex, time-consuming and highly contested cases ever filed with OHA. Because of this level of difficulty, the average OHA productivity rate is .60 decision per analyst/attorney per month. OHA estimates that its beginning compliance-related inventory in FY 1987 will be 247 cases and, with a staffing level of 84 full-time staff

year equivalents, that the inventory of unresolved compliance cases at the end of FY 1987 will total 154. In addition, OHA anticipates receiving approximately 200 non-compliance related cases in FY 1986 and 200 cases in FY 1987. Based on an estimated FY 1987 beginning inventory of 121 non-compliance cases, OHA estimates that its inventory of unresolved non-compliance related cases at fiscal year end will total 51. Thus, funding at this level will provide for the resolution of 423 compliance and non-compliance cases, and result in a case inventory decrease of approximately 44 percent. It will also enable OHA to continue processing refund applications in existing Subpart V proceedings.

The requested level of funding and accompanying staffing level of 84 FTEs are also necessary because OHA may be asked to distribute between $1,400,000,000 and $3,700,000,000 in additional overcharges recovered by the DOE. OHA's budget request represents a measured response to its known workload, as well as maintaining the capability for any increased responsibility this Office may be asked to undertake. OHA requests that it be funded at the requested level for FY 1987 in order to support its proposed level of staffing, meet acceptable processing times for petitions and applications in inventory, and continue processing its workload resulting from the distribution of refund monies pursuant to the DOE regulations at 10 C.F.R. Part 205, Subpart V.

In addition, the sequence of case processing of the Office is governed to an extent by statute and procedural rules which prescribe maximum processing times in certain proceedings such as Freedom of Information Act appeals, requests for stay and requests for temporary exception relief. In order to conform with these prescriptive time limitations, OHA is required to accord priority treatment to those petitions. Since most compliance-related cases do not carry this priority, any reduction in funding or personnel disproportionately affects these compliance cases and therefore frustrates the goal of terminating all matters related to the prior regulatory programs.

It should be noted that all OHA budget requests utilize workload data provided by the Economic Regulatory Administration. Any change in the projected level of activity for ERA for either FY 1986 or FY 1987 is likely to change OHA's rate of case receipts.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
KEY ACTIVITY SUMMARY

OFFICE OF HEARINGS AND APPEALS

KEY ACTIVITY	ACTUAL ACTIVITIES DURING FY 1985	ESTIMATED ACTIVITIES DURING FY 1986	PLANNED ACTIVITIES DURING FY 1987
Compliance and related filings.	During FY 1985 OHA received 225 new compliance and related cases, and resolved 271 cases.	As of October 1, 1985, OHA had approximately 283 compliance and related cases in inventory. Using ERA projections, OHA expects to receive approximately 120 new filings in FY 1986. On the basis of regulatory processing requirements and average actual productivity rates, OHA expects to resolve 156 compliance and related cases during FY 1986 and have an inventory of 247 pending compliance cases on hand at fiscal year end.	Using ERA projections, OHA expects to receive 60 cases related to compliance actions during FY 1987. With the requested funding and staffing, 153 petitions should be resolved leaving 154 open compliance and related cases at the end of FY 1987.
Non-compliance filings.	During FY 1985 OHA resolved 574 non-compliance cases. This includes the issuance of 397 final decisions implementing Subpart V procedures to distribute refund monies within OHA's jurisdiction.	As of October 1, 1985, approximately 219 non-compliance cases were on hand and new receipts are projected to be approximately 200. Of these 419 cases, 298 are projected to be resolved during FY 1986. Thus approximately 121 of these cases would remain in inventory at the end of FY 1986.	An estimated 200 non-compliance cases are projected to be received for FY 1987, in addition to the open inventory of 121 cases remaining from FY 1986. It is expected that all except 51 of these cases would be resolved during the fiscal year.

KEY ACTIVITY	ACTUAL ACTIVITIES DURING FY 1985	ESTIMATED ACTIVITIES DURING FY 1986	PLANNED ACTIVITIES DURING FY 1987
Subpart V applications.	During FY 1985 OHA processed over 1,900 applications, resulting in refunds of more than $27,600,000 to injured parties.	As of October 1, 1985, OHA had approximately 3,103 refund applications pending. The number of refund applications to be received during FY 1986 is directly related to the level of ERA settlement activity and the number of Subpart V petitions filed with OHA, and cannot be accurately estimated.	OHA will continue processing refund applications received as a result of Subpart V proceedings which it administers.

NOTE: Each OHA staff member works on matters relating to more than one of the above key activities. There is no way to estimate accurately, therefore, the amount of staff hours (and corresponding portions of OHA's budget) actually spent on each of OHA's various functions. Accordingly, it is not possible to calculate the estimated costs for each of the above key activities.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
AMOUNTS AVAILABLE FOR OBLIGATION

OFFICE OF HEARINGS AND APPEALS
(In thousands of dollars)

	FY 1986	FY 1987
Appropriation	5,275	5,000
Proposed Supplementals:		
Pay Cost	--	--
Subtotal	5,275	5,000
Comparative Transfer To:	--	--
Comparative Transfer From:	--	--
Subtotal	--	--
Subtotal, Budget Authority	5,275	5,000
Receipts and Reimbursements:		
Unobligated Balances, Start of Year	--	--
Unobligated Balances, End of Year	--	--
Total, Obligations	5,275	5,000

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
ANALYSIS OF BUDGET BY OBJECT CLASS
APPROPRIATION
(in thousands of dollars)

OFFICE OF HEARINGS AND APPEALS

		FY 1985 (actual)	FY 1986 (estimate)	FY 1987 (estimate)
Direct Obligations:				
	Personnel compensation:			
11.1	Full-time permanent	3,032	2,943	2,785
11.3	Other than full time	270	262	248
11.5	Other personnel compensation	38	37	35
	Total personnel compensation	3,340	3,242	3,068
12.1	Personnel benefits: Civilian	379	368	349
21.0	Travel and transportation of persons	18	21	20
22.0	Transportation of things	22	32	30
23.0	Rent, communications, and utilities	578	946	898
24.0	Printing and reproduction	369	277	262
25.0	Other services	141	297	281
26.0	Supplies and materials	80	92	92
	Total, direct obligations	4,927	5,275	5,000

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
ANALYSIS OF BUDGET BY OBJECT CLASS
APPROPRIATION
(in thousands of dollars)

OFFICE OF HEARINGS AND APPEALS

		FY 1987 (base)		FY 1987 (estimate)		Increase (+) or Decrease (-)	
		FTE	Amount	FTE	Amount	FTE	Amount
Direct Obligations:							
Personnel compensation:							
11.1	Full-time permanent	86	2,943	82	2,785	-4	-158
11.3	Other than full time	4	262	2	248	-2	-14
11.5	Other personnel compensation		37		35		-2
	Total personnel compensation	90	3,242	84	3,068	-6	-174
12.1	Personnel benefits: Civilian		368		349		-19
21.0	Travel and transportation of persons		21		20		- 2
22.0	Transportation of things		32		30		- 2
23.0	Rent, communications, and utilities		946		898		-48
24.0	Printing and reproduction		277		262		-15
25.0	Other services		297		281		-16
26.0	Supplies and materials		92		92		0
	Total direct obligations		5,275		5,000		-275

NOTE: The above object class distributions reflect the allocation of resources presented in the fiscal year 1987 Congressional justification. Some estimates may differ from those shown in the budget appendix due to technical adjustments made subsequent to submission of the appendix.

DEPARTMENT OF ENERGY
FY 1987 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF SUPPORT REQUIRED FROM EIA
(in thousands of dollars)

PROGRAM	FY 1985	FY 1986	FY 1987
Office of Hearings and Appeals	$10	$12	$12
Total	$10	$12	$12

Narrative: In order to assist the Office of Hearings and Appeals (OHA) in the processing of its Subpart V refund proceedings, OHA occasionally requires from EIA historical data on volume and prices of covered product sold by a particular firm during a specified period, and a comparison of that data with national averages.

DEPARTMENT OF ENERGY

FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST

ENERGY INFORMATION ACTIVITIES

VOLUME 7

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DEPARTMENT OF ENERGY

Proposed Appropriation Language

Energy Information Administration

For necessary expenses in carrying out the activities of the Energy Information Administration, [$60,682,000] $59,651,000. (Department of the Interior and Related Agencies Appropriations Act, 1986, as included in Public Law 99-109.)

DEPARTMENT OF ENERGY

FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF ESTIMATES BY APPROPRIATION BY MAJOR ACTIVITY

ENERGY INFORMATION ACTIVITIES

BUDGET AUTHORITY IN THOUSANDS OF DOLLARS

	FY 1985 Actual	FY 1986 Estimate	FY 1987 Request
National Energy Information System	$ 52,065	$ 50,001	$ 49,128
Policy and Management	8,854	7,723	10,523
Total, Energy Information Activities	$ 60,919	$ 57,724	$ 59,651

DEPARTMENT OF ENERGY
FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST
AMOUNTS AVAILABLE FOR OBLIGATION
ENERGY INFORMATION
(In thousands of dollars)

	FY 1986	FY 1987
Appropriation	$57,724	$59,651
Proposed supplemental	0	0
Subtotal	$57,724	$59,651
RECEIPTS AND REIMBURSEMENTS		
Federal Energy Regulatory Commission	$ 4,663	$ 4,663
Strategic Petroleum Reserve	800	800
Policy, Safety, and Environment	163	163
Hearings and Appeals	10	35
Nuclear Energy	0	10
International Affairs and Energy Emergencies	260	350
Office of Civilian Radioactive Waste Management	1,015	1,024
Environmental Protection Agency	60	89
Department of Navy	60	60
U. S. Synfuels Corporation	3	0
Peace Corps	5	5
Bureau of Economic Analysis (Commerce)	2	2
Bureau of Land Management (Interior)	10	10
Social Security Administration	105	105
Total obligations	$64,880	$66,967

DEPARTMENT OF ENERGY
FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST
PROGRAM OVERVIEW
ENERGY INFORMATION

The mission of the Energy Information Administration (EIA) is to produce meaningful, timely, and accurate energy information for decisionmakers within the Executive Branch, Congress, State Governments, industry, and the public. Information is provided for those who make decisions about energy in all sectors of the society so that they may make these decisions well. To accomplish this mission the EIA collects, processes, and integrates energy data, exercising independent judgment in the gathering, analysis, and dissemination of information, and serving as the preeminent source of, and reference standard for, national energy statistics and objective energy analysis.

This budget request of $59,651,000 and 455 full-time equivalent (FTE) staff years (plus 20 FTE reimbursed by the Federal Energy Regulatory Commission and 4 FTE funded by the Nuclear Waste Fund for a total of 479 FTE for EIA) recognizes constraints imposed by the budget deficit. The request is $440,000 and 6 FTE below the adjusted FY 1986 level (FY 1987 base). The request is divided into two decision units: 1) the National Energy Information System and 2) Policy and Management. Major program increases are requested in the amount of $500,000 in the National Energy Information System for EIA funding for the Uranium Industry Viability Assessment program, which was funded in previous years by Nuclear Energy, and $2,583,000 in Policy and Management for administrative support services provided by the Department. Several program decreases totalling $3,562,000 are proposed, including decreases in quality maintenance activities, modeling and analysis activities, computer equipment purchases, and publication and inquiry activities.

The following accomplishments are planned for FY 1986:

- Operate basic energy data collection programs to provide timely, integrated, and accessible data.
- Distribute various weekly, monthly, quarterly, annual, and one-time reports on energy statistics and forecasts.
- Prepare short- and intermediate-term energy supply and demand forecasts through FY 1995 for primary energy sources and sectors.
- Maintain short- and intermediate-term models and other analysis tools.
- Produce and publish the EIA Annual Energy Review, the Annual Energy Outlook, the International Energy Outlook, and the quarterly Short-Term Energy Outlook.
- Provide basic support to the Federal Energy Regulatory Commission (FERC) and the Office of Civilian Radioactive Waste Management on a reimbursable basis to allow their regulatory functions to be sustained.

- Provide energy information services to satisfy the needs of other components of the Department.
- Provide data and analysis support to the Social Security Administration on a reimbursable basis to facilitate evaluation of the Low Income Home Energy Assistance Program.
- Provide the Executive Branch, Congress, State governments, industry and the public access to the National Energy Information System (NEIS) and respond to requests from the White House, Congress, and other Federal agencies for special reports as resources will allow.
- Conduct quality maintenance and audit activities.
- Field a manufacturing energy consumption survey.
- Begin implementation of the Nonresidential Buildings Energy Consumption Survey.
- Conduct an analysis of energy conservation in the residential sector for the General Accounting Office and the Senate Committee on Energy and Natural Resources.

Specific objectives for FY 1987 to FY 1990 are:

- Operate EIA basic data collection programs on traditional fuel sources.
- Continue to produce and distribute EIA energy information products on traditional fuel sources.
- Conduct surveys to measure the change in energy consumption and expenditure patterns in the residential, commercial, and manufacturing sectors of the economy.
- Produce short- and intermediate-term forecasts with accompanying analyses.
- Provide basic energy information support to other components of the Department, including the Federal Energy Regulatory Commission and the Office of Civilian Radioactive Waste Management on a reimbursable basis.
- Provide the Executive Branch, Congress, State governments, industry and the public access to the NEIS and respond to high priority requests from the White House, Congress, and other Federal agencies for special reports as resources will allow.
- Make necessary investments in quality maintenance activities and audits.
- Continue to manage EIA programs with minimum overhead.

DEPARTMENT OF ENERGY
FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE

ENERGY INFORMATION ADMINISTRATION

(Tabular dollars in thousands, narrative in whole dollars)

	FY 1985 Approp.	FY 1986 Approp.	FY 1987 Base	FY 1987 Request	Request vs. Base
National Energy Information System [1]					
Operating Expenses.....	$52,065 [2]	$50,001	$51,908	$49,128	- $2,780
Subtotal.....	$52,065	$50,001	$51,908	$49,128	- $2,780
Policy and Management					
Operating Expenses.....	$ 8,854	$ 7,723	$ 8,183	$10,523	+ $2,340
Subtotal.....	$ 8,854	$ 7,723	$ 8,183	$10,523	+ $2,340
TOTAL					
Operating Expenses.....	$60,919	$57,724	$60,091	$59,651	- $ 440
Total, Energy Information Administration (EIA).....	$60,919 [2]	$57,724	$60,091	$59,651	- $ 440
Staffing Total FTE:					
Direct [3].....	460 [4]	461	461	455	- 6
Reimbursable.....	20	20	20	20	

Authorization: P.L.'s 75-688, 93-319, 94-963, 94-385, 95-91, 95-619, 95-620, 95,621, 96-102, 96-294, 97-257, 97-415, and 16 U.S.C. 791a et. seq.

[1] The National Energy Information System decision unit was reported in previous years under two separate decision units -- 1) Collection, Production, and Analysis and 2) Program Services.

[2] Includes $263,000 deferral.

[3] Excludes 4 FTE funded by the Nuclear Waste Fund.

[4] Actual FY 1985 FTE.

Department of Energy

FY 1987 Congressional Budget Request

Adjustments to FY 1986 Appropriations

	FY 1986 Conference	Total	Comparabilities	Total
Energy Information Administration				
National Energy Information System				
Operating Expenses:				
Oil and Gas	-	-	$12,267	$12,267
Coal, Nuclear, Electric and Alternate Fuels	-	-	3,912	3,912
Energy Markets & End Use	-	-	4,362	4,362
ADP Services	-	-	9,336	9,336
National Energy Information Center	-	-	733	733
Statistical Standards	-	-	879	879
Program Direction	-	-	18,512	18,512
Total, National Energy Information System (NEIS)	-	-	$50,001	$50,001
Operating	-	-	50,001	50,001

Department of Energy

FY 1987 Congressional Budget Request

Adjustments to FY 1986 Appropriations

	FY 1986 Conference	General Reduction	G-R-H Reduction	Total
Energy Information Administration				
Policy & Management				
Operating Expenses:				
Program Direction	$7,544	$-45	$-217	$7,282
Program Support.....	575	- 4	-130	441
Subtotal, Policy and Management.....	$8,119	$-49	$-347	$7,723
General Reduction	-49	49	-	-
Total, Policy & Management	$8,070	-	$-347	$7,723
Operating	8,070	-	-347	7,723

Summary of Changes
Energy Information Administration
Energy Information
(Dollars in thousands)

FY 1986 Appropriation enacted	$60,318
Balanced Budget and Emergency Deficit Control Act adjustment	- 2,594
FY 1986 Budget Authority	$57,724
Additional Pay Costs (Within Grades, Promotions, Increased Contributions to Retirement and Benefits)	+ 586
Contract, Travel, and Training Inflation	+ 1,676
Contract Award Fees	+ 105
FY 1987 Base	$60,091
Program Increases:	
Uranium Industry Viability Assessment	+ 500
Administrative Support Services Provided by M&A	+ 2,583
Program Direction, National Energy Information System	+ 39
Program Decreases:	
Petroleum Marketing Information	- 225
State Heating Oil Grants Program Funding	- 190
Coal Data and Analysis	- 240
Electric Power Data and Analysis	- 250
Uranium Data and Analysis	- 101
Financial Data and Analysis	- 365
Energy Consumption Information	- 420
State Energy Data System	- 95
Computer and Telecommunications Equipment	- 1,110
Computer Facilities Management	- 100
Publication and Microfilming Services	- 161
Statistical Support Services	- 62
Systems Integration Activities	- 155
Planning and Management	- 88
FY 1987 Request	$59,651

Energy Information Administration
Energy Information
(Tabular dollars in thousands, narrative in whole dollars)

	FY 1985 Approp.	FY 1986 Approp.	FY 1987 Base	FY 1987 Request	Request vs. Base
National Energy Information System					
Operating expenses:					
Oil and Gas	$13,918	$12,267	$12,794	$12,379	-$ 415
Coal, Nuclear, Electric, and Alternate Fuels	6,244	3,912	4,080	3,989	- 91
Energy Markets and End Use	4,096	4,362	4,550	3,670	- 880
ADP Services	7,297	9,336	9,737	8,527	- 1,210
National Energy Information Center	771	733	765	604	- 161
Statistical Standards	255	879	917	855	- 62
Program Direction	19,484	18,512	19,065	19,104	+ 39
Total, National Energy Information System (NEIS)	$52,065	1/ $50,001	$51,908	$49,128	-$2,780
Staffing, NEIS FTE:					
Direct 2/	426	3/ 428	427	421	- 6
Reimbursable	20	20	20	20	

Authorization: P.L.'s 75-688, 93-319, 94-963, 94-385, 95-619, 95-620, 95-621, 96-102, 96-294, 97-415, 97-257, & 95-91, and 16 U.S.C. 791a et. seq.

1/ Includes $263,000 deferral.

2/ Excludes 4 FTE funded by the Nuclear Waste Fund.

3/ Actual FY 1985 FTE.

Summary of Changes
National Energy Information System
(Dollars in thousands)

FY 1986 Appropriation Enacted		$52,248
Balanced Budget and Emergency Deficit Control Act adjustment		- 2,247
FY 1986 Budget Authority		$50,001
Within-Grades, Promotions, Awards, Increased Contribution to Retirement and Benefits	+	545
Contract, Travel and Training Inflation	+	1,408
Shift 1 FTE to Policy and Management (P&M)	-	46
FY 1987 Base		$51,908
Program Increases:		
Uranium Industry Viability Assessment	+	500
Program Direction	+	39
Program Decreases:		
Petroleum Marketing Information	-	225
State Heating Oil Grants Program Funding	-	190
Coal Data and Analysis	-	240
Electric Power Data and Analysis	-	250
Uranium Data and Analysis	-	101
Financial Reporting System	-	365
Energy Consumption Information	-	420
State Energy Data System	-	95
Computer and Telecommunications Equipment	-	1,110
Computer Facilities Management	-	100
Publication and Microfilming Services	-	161
Statistical Support Services	-	62
FY 1987 Request		$49,128

The National Energy Information System (NEIS) contains the operational elements of the EIA. The FY 1987 request is for $49,128,000 and 421 FTE plus 20 FTE reimbursed by the Federal Energy Regulatory Commission (FERC) and 4 FTE funded by the Office of Civilian Radioactive Waste Management. The request is $2,780,000 and 6 FTE below the FY 1986 adjusted level (FY 1987 base). Section 52(b) of the Federal Energy Administration Act of 1974 (FEA Act), P.L. 93-275, states that the "System shall contain such information as is required to provide a description of and facilitate analysis of energy supply and consumption within and affecting the United States...." The organization of the EIA especially addresses the needs of this mandate by a comprehensive treatment of energy information: energy data are collected, interpreted, and analyzed; their quality is evaluated and maintained; they are disseminated regularly to other parts of the Department of Energy, the Congress, other Executive Agencies, the States, and the public; they are stored, processed and published by state-of-the-art automated data processing hardware and software.

The NEIS decision unit is composed of: the Office of Oil and Gas, the Office of Coal, Nuclear, Electric and Alternate Fuels, the Office of Energy Markets and End Use, the Automatic Data Processing (ADP) Services Staff, the National Energy Information Center, and the Office of Statistical Standards. The information systems developed by these offices enable the EIA to exercise independent judgment in the gathering, interpretation and dissemination of energy related information. These offices also provide basic energy information services to support other Department of Energy offices and the FERC which are funded on a reimbursable basis.

The program activities of the EIA are mandated by Section 205 of the Department of Energy Organization Act (P.L. 95-91), which requires the creation of an independent agency as a central point within the Department for the gathering, analysis, and dissemination of energy information. These activities are also mandated by Section 52 of the FEA Act (mentioned above) which requires the creation of a comprehensive data base, the NEIS; by Section 13(a) of the FEA Act, which requires the collection of energy information to carry out the functions of the FEA Act; by Section 11 of the Energy Supply and Environmental Coordination Act; and by several other legislative authorities.

The Office of Oil and Gas conducts information programs concerning petroleum and natural gas reserves, production, refining, distribution, marketing and prices. This Office collects, processes, verifies, analyzes and prepares reports of information concerning these energy sources. The FY 1987 request for the Office of Oil and Gas is $12,379,000 and 151 FTE, a decrease of $415,000 and 5 FTE from the FY 1987 base level, and will result in the program reductions described below.

The major thrust of the Office's petroleum supply program is the regular collection and prompt publication of crude oil and petroleum product supply statistics. This program produces publications such as the Weekly Petroleum Status Report, the Petroleum Supply Monthly, the Petroleum Supply Annual, and provides input to several EIA integrated information products. This program also provides information access to energy analysts throughout the Department for their use in administering numerous programs which depend upon timely, comprehensive information. In FY 1987, most core activities

will be maintained at the FY 1986 level. The Weekly Petroleum Status Report, providing regular information on the petroleum supply situation, will be maintained but follow-up quality assurance procedures will be curtailed. A three-year effort to develop automated data error dectection measures for the weekly and monthly surveys will be completed. Follow-up quality checks on certain other series (e.g., imports, unaccounted-for crude oil, refinery utilization and capacity) will be ended. These cutbacks will affect the quality of the data; however, they are not expected to have a major impact on the overall integrity of these EIA products.

The Office's reserves and natural gas program combines petroleum reserves and natural gas data gathering, analysis, and publication activities with major support services for the FERC. (All work for FERC is done on a reimbursable basis. No contract, computer or staffing funds are included in this request to support the FERC.) The program produces the U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves Annual Report, the Natural Gas Monthly, the Natural Gas Annual, and input into several integrated publications. Analyses examine critical aspects of the natural gas situation, and model results feed the EIA Annual Energy Outlook. In FY 1987, the Foreign Energy Supply Assessment Program will be cancelled, as will planned surveillance field studies. Analyses of the petroleum and natural gas markets will be continued, including completion of an updated natural gas supply analysis to reflect the changing regulatory environment. The Integrated Natural Gas Data Base will be completed.

The petroleum marketing program gathers, analyzes, and publishes information on crude oil and petroleum product sales, prices, and distribution in the Petroleum Marketing Monthly, the Petroleum Marketing Annual, and in EIA's integrated information publications. The program conducts market trend analyses concerning supply/price anomalies, and maintains a comprehensive integrated petroleum marketing universe and survey frame. In FY 1987, petroleum marketing activities will be scaled back by eliminating efforts to resolve frames coverage problems associated with diesel fuel, kerosene, and propane supplies, and by abandoning the effort to consolidate petroleum marketing data bases. The State heating oil grant program will not be funded.

The Office of Coal, Nuclear, Electric, and Alternate Fuels develops, operates and maintains the statistical and analytical information systems necessary to collect, process, and interpret data and conduct analysis and short- and intermediate-term forecasting activities in the respective fuel areas. These activities result in the production of statistical periodicals, technical reports, and analysis reports. This Office also provides major contract and staff support to the FERC and to the Office of Civilian Radioactive Waste Management on a reimbursable basis. The FY 1987 request for this office is $3,989,000 and 112 FTE, a decrease of $91,000 in contracts and 2 FTE from the FY 1987 base level, and will result in the program changes described below.

The coal program collects data and produces statistical reports, data interpretations, and analyses necessary for the publication of a basic series of publications; maintains continuity of historical data bases, and provides timely and relevant coal data and interpretation. It produces basic publications such as the Weekly Coal Report, the Coal Distribution Report, the Quarterly Coal Report and the Annual Coal Production Report.

The Coal Supply and Transportation Model, the International Coal Trade Model, and the National Coal Model are the major tools for conducting analyses and preparing analysis reports in the areas of coal exports, coal supply, and coal transportation. In FY 1987, due to funding decreases, the publication of results from the quarterly survey of coal producers and distributors, which monitors coal production, stocks, and shipments, and the annual survey of coal mining operations, which monitors production, stocks, productive capacity, recoverable reserves, employment, and productivity will be somewhat less timely. There will be a reduction in coal model maintenance and data updates. Quality maintenance, particularly requirements analyses for existing data programs, will be deferred.

The electric power program produces statistics, analyses, and other information necessary for the publication of monthly, quarterly, annual, and one-time reports covering generation, capacity, stocks, receipts, sales, price, construction costs, bills, fuel consumption, and financial information in the electric power area. It also provides support to the FERC; the Department's Offices of Fossil Energy and Policy, Planning, and Analysis; the Department of Commerce's Bureau of Economic Analysis; and the Environmental Protection Agency on a reimbursable basis in their conduct of analytical and regulatory activities in the field of electric power. The electric power statistical publications include the Electric Power Monthly, the Electric Power Quarterly, the Electric Power Annual, Cost and Quality of Fuels for Electric Utility Plants, the Inventory of Power Plants in the United States, Typical Electric Bills, Financial Statistics of Selected Electric Utilities, and Historical Plant Cost and Annual Production Expenses for Selected Electric Plants. Reductions in FY 1987 will cause deferrals in quality maintenance and analysis activities.

The nuclear and alternate fuels program produces basic nuclear and alternate fuels statistics and information necessary for the publication of periodic timely analyses relevant to the issues under consideration by decisionmakers. This program maintains historical data series, including three nuclear energy data collections assumed from the Assistant Secretary for Nuclear Energy in September 1981. This program is also responsible for data gathering, analysis, and reporting related to Section 23 of P.L. 97-415. This Act requires annual monitoring of the viability of the domestic uranium industry through 1992. The Secretary has delegated responsibility to EIA for the data collection and analysis of this activity and the reporting of the results. The uranium viability assessment program will be funded by EIA beginning in FY 1987 and accounts for a program increase of $500,000. This activity was funded previously by the Department's Office of Nuclear Energy which transferred money to EIA for program implementation. In FY 1987, the alternate fuels program will be reduced to minimal monitoring of activities in this energy area. Nuclear fuel cycle analysis efforts will be limited below current levels.

This program also provides information gathering and analysis activities in support of the Department's efforts to implement the Nuclear Waste Policy Act of 1982 (P.L. 97-425). However, these activities are conducted on a reimbursable basis and do not affect EIA's budget request. These activities include collecting data from electric utilities operating nuclear power plants; analyzing such data as required by the Office of Civilian

Radioactive Waste Management; verifying nuclear waste fund fee payments by utilities; implementing and maintaining a data base on spent nuclear fuel assemblies; and forecasting nuclear electricity generation, spent fuel discharges, and disposal requirements.

The Office of Energy Markets and End Use maintains energy statistical and analytical information systems concerning energy consumption and other subjects which cut across different energy sectors. This information is provided by data collection and processing and analyses and projections associated with energy end use, price, supply and demand balances, and economic, international, and financial matters. The FY 1987 request for the Office of Energy Markets and End Use is $3,670,000 and 96 FTE, a decrease of $880,000 in contracts and 3 FTE from the FY 1987 base level, and will require the program reductions described below.

The integrated energy information program produces basic data and energy forecasts which cut across all energy sources. The Monthly Energy Review presents key energy statistics on a monthly basis. Historical data from EIA reports and other sources are compiled in the Annual Energy Review. Energy forecasts are presented both in the quarterly Short Term Energy Outlook, which contains projections of world oil market and U.S. energy production, consumption, and prices for up to 18 months, and the Annual Energy Outlook, which provides an integrated forecast of energy production, consumption and prices. The capability to develop forecasts through the year 2000 is provided through the use of the Intermediate Future Forecasting System, the Oil Market Simulation model, and the Petroleum Allocation model. In FY 1987, most of the reports produced by this program will continue; however, the State Energy Data Report and the State Energy Price and Expenditures Report will be eliminated. Updating the energy models used for the data and analysis reports will be deferred, as will scheduled quality maintenance activities. Personal computer-based models will be used to reduce the need for direct access to commercial models such as DRI, Chase Econometric, and Wharton Econometric. EIA's annual support to Stanford University's Energy Modeling Forum will be discontinued.

Energy industry financial analysis is also performed by the Office of Energy Markets and End Use. In FY 1987 financial analyses based on publicly available energy industry performance information will be undertaken, while direct collection of Financial Reporting System information will not be done. The Financial Reporting System was proposed for elimination in the Congressional Reports Elimination Act of 1985 (S. 992) which is pending before Congress. Funds to conduct the Financial Reporting System in FY 1986 were added to EIA's FY 1986 Budget through the Continuing Resolution.

The international and contingency information program maintains basic energy data systems for speed and responsiveness to support international data collection and analysis and the contingency planning and emergency operations of the Department of Energy and related interagency groups. This includes production of the International Energy Annual and the International Energy Outlook, continuous monitoring of the international oil market, and the maintenance and documentation of all contingency planning models. In FY 1987 support to the Department's contingency analysis will be curtailed, but other activities will be continued.

The energy end use information program carries out surveys of energy end use consumption in the residential, non-residential buildings, and industrial sectors on a triennial cycle that was begun in the FY 1986 budget. The FY 1987 budget requests funds for the Residential Energy Consumption Survey (RECS) which collects data on residential energy consumption and expenditures and on the characteristics of structures, households, and the stock of energy-using equipment. These data have been used extensively within the Department, by other Federal agencies, and the Congress for policy development and evaluation. For example, the RECS data are used by the Social Security Administration in implementing and evaluating the Low Income Home Energy Assistance Program and by the Bureau of Labor Statistics in adjusting the Consumer Price Index. These data have also been used by the Office of Management and Budget in analyzing the Low Income Weatherization Program, and by the General Accounting Office and the Congress for analyses of energy savings in the residential sector through conservation measures. Quality maintenance activities for the remaining surveys will be reduced in FY 1987.

The ADP Services Staff provides computer processing support services for EIA's and other Department components' energy information programs and for FERC regulatory programs. The FY 1987 request for ADP Services is $8,527,000 and 12 full time equivalent staff years, a decrease of $1,210,000 from the FY 1987 base level. This office operates a major computer facility consisting of a large-scale computer system, a nationwide telecommunications network, and systems software programs providing high level computer languages, data base management systems, and modeling, simulation, statistical processing, text editing, table processing, and graphics packages. This major data processing complex is accessible to users through a data communications network operating seven days a week, consisting of many computer terminals and remote job entry stations. In addition to the EIA funds requested, about $2,700,000 in reimbursables is estimated as needed to cover the total budget requirements for the EIA computer facility. In 1987, major external users of energy information computer support will be the FERC, the Strategic Petroleum Reserve Office, the Office of Civilian Radioactive Waste Management, and the Economic Regulatory Administration. Compared to FY 1986, the operation of the computer system will be sustained, but the schedule for some planned purchases of peripheral computer and telecommunications equipment, along with some terminal equipment purchases, will be altered. There also will be reductions to support provided by the facilities management contractor.

The National Energy Information Center performs final editorial and graphics preparation and public dissemination activities for all EIA information products. These activities are conducted to disseminate data publications, interpretive analysis reports, forecast reports, information directories, and public use tapes and microfiche. Dissemination also includes response to public inquiries. The FY 1987 request for this program is $604,000 and 22 FTE, a decrease of $161,000 from the FY 1987 base level and an increase of 2 FTE. The decreased funding level will result in reductions in the microfilming of EIA documents, publications support, and mail list maintenance. The increase of 2 FTE are for the implementation of a centralized reports preparation program using the EPIC/JANUS automated publication system.

The Office of Statistical Standards provides coherent and credible strategies across EIA for information collection, analysis, and forecasting; develops processing and documentation standards; and coordinates standard

definitions. The Office manages the Department's energy information forms clearance process and respondent burden control program within the Department, including preparation of the energy information part of the Department's annual Information Collection Budget. The Office also verifies the quality and meaningfulness of energy information and the processes used to collect, analyze, and forecast it. The FY 1987 request for this program is $855,000 and 28 full time equivalent staff years, a decrease of $62,000 from the FY 1987 base level and an increase of 1 FTE.

In carrying out its responsibilities, the Office processes energy information forms clearance packages for the Department, provides design review of data collection forms, reviews information collection systems within the Department, and produces various reports which monitor burden upon the public resulting from the Department's energy data collections. The Office is also responsible for maintaining the Data Resources Directory which is used for managing the Information Collection Budget and related activities, including publishing forms and model directories; for preparing survey and sampling designs; for developing universe lists and sampling frames policies and methodologies; and for developing data collections standards and procedures. It has the further responsibility for evaluating data and analytical systems, for ensuring the integrity of archiving and documentation, and for inspecting the quality of data and forecasting systems. Reductions from the FY 1986 level will be achieved by deferring some modeling quality audit projects and by postponing publication of a Handbook of Methods. The forms clearance and burden control programs will be operated at last year's plateau. The additional FTE is needed to provide more timely review of EIA products prior to publication.

Program direction costs for NEIS consist of salaries, benefits, and travel expenses for NEIS staff. The Departmental request of $19,104,000 provides for payroll and travel costs for 421 FTE, an increase of $39,000 from the FY 1987 base level. The program direction increase is due to the fact that EIA entered FY 1986 considerably understaffed. Combined with the understaffing, the impact of the FY 1986 reductions associated with the Balanced Budget and Emergency Deficit Control Act of 1985 (Gramm-Rudman-Hollings reduction) resulted in decreases to the FY 1986 budget value for this program. The FY 1987 budget request assumes continued hiring to reach the FY 1987 FTE ceiling of 421. The request does not include 24 FTE which are funded on a reimbursable basis by the FERC and the Office of Civilian Radioactive Waste Management.

Personnel Resources

	FY 1985 1/	FY 1986	FY 1987
Oil and Gas:			
Direct	157	156	151
Reimbursable (FERC)	11	11	11
Coal, Nuclear, Electric and Alternate Fuels:			
Direct	116	114	112
Reimbursable (FERC)	9	9	9
Nuclear Waste Funded	4	4	4
Energy Markets and End Use:			
Direct	97	99	96
ADP Services:			
Direct	11	12	12
National Energy Information Center:			
Direct	21	20	22
Statistical Standards:			
Direct	24	27	28
Total, National Energy Information System:			
Direct	426	428	421
Reimbursable (FERC)	20	20	20
Nuclear Waste Funded	4	4	4

1/ Actual FY 1985 FTE.

Anticipated Workload - National Energy Information System*

	FY 1985	FY 1986	FY 1987
Oil and Gas - DOE			
Data gathering systems maintained	19	19	19
Models maintained	9	9	9
Data reports prepared**	28	28	28
Analysis and interpretive reports prepared**	34	34	34
One-time special projects	9	10	9
Oil and Gas - Support to FERC (reimbursable)			
Data gathering systems maintained	12	12	12
Data reports prepared**	4	4	4
Coal, Nuclear, Electric, and Alternate Fuels - DOE			
Data gathering systems maintained	15	17	18
Models maintained	12	13	13
Data reports prepared**	15	15	15
Analysis and interpretive reports prepared**	12	9	9
One-time special projects	5	5	3
Coal, Nuclear, Electric, and Alternate Fuels - Support to FERC (reimbursable)			
Data gathering systems maintained	9	9	9
One-time special projects	1	1	1
Coal, Nuclear, Electric, and Alternate Fuels - Support to Nuclear Waste Program (reimbursable)			
Data gathering systems maintained	2	2	2
Models maintained	1	1	1
One-time special reports	2	2	1
Energy Markets and End Use - DOE			
Data gathering systems maintained	11	11	8
Models maintained	13	12	12
Data reports prepared**	21	15	15
Analysis and interpretive reports prepared**	22	21	18
One-time special projects	7	7	5

* Workload indicators do not take into account varying complexity factors (e.g. number of respondents and number and type of data elements included); therefore, units are not necessarily comparable.

** Each separate title is counted as one report, regardless of whether it is weekly, monthly, quarterly, or annual. FERC analysis reports are jointly sponsored with EIA.

Anticipated Workload - National Energy Information System (cont.)

	FY 1985	FY 1986	FY 1987
ADP Services - DOE			
Technical assistance responses	6,480	7,100	8,000
Batch jobs processed	1,150,468	1,226,000	1,300,000
Interactive sessions supported	619,213	681,000	720,000
CPU hours supported	8,436	9,300	10,000
Validated users	2,564	2,900	3,000
Connect time (hours)	508,866	580,000	630,000
Lines printed (in thousands)	1,208,854	1,500,000	1,600,000
ADP Services - FERC			
Technical assistance responses	1,114	1,114	1,200
Batch jobs processed	150,150	150,150	150,150
Interactive sessions supported	120,811	120,811	120,000
CPU hours supported	949	949	949
Validated users	289	289	289
Connect time (hours)	70,120	70,120	70,000
Lines printed (in thousands)	186,508	186,508	200,000
Energy Information Center			
Separate issues of publications written/edited/reviewed	250	250	250
Separate issues of publications disseminated	700,000	700,000	700,000
Inquiries handled	70,000	70,000	70,000
Documents, forms, and tables classified/indexed	60,000	10,000	8,000
Directories published	11	11	10
Documents microfilmed	1,200,000	200,000	150,000
One-time publications prepared	30	30	30
Separate issues of publications produced through EPIC/JANUS	12	100	220
Statistical Standards - DOE			
Forms clearance packages processed	90	85	35 [1/]
Public burden hours--DOE energy information and statistical data collections (in millions)	1.1	1.1	1.0
Forms management reports	45	45	45
Reports reviewed	150	150	150
Surveys reviewed	6	10	10
Surveys designed	2	0	0
Standards developed	10	15	10

1/ Decrease in FY 1987 results from packaging EIA forms clearance requests on a program level rather than an individual form level.

Data quality assessments	1	1	1
Data system audits	8	8	7
Model audits	2	3	2
Model evaluation software	0	0	1
Models archived	25	30	30
Information collection budget preparation and maintenance	1	1	1
Data resource directory files developed	2	0	0
Data resource directory files maintained	7	7	6
Technical papers	10	10	7
Quality management reports	4	3	3
Statistical Standards - FERC			
Forms clearance packages processed	50	50	50
Public burden hours (in millions)	4.5	4.5	4.5

DEPARTMENT OF ENERGY
FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST
KEY ACTIVITY SUMMARY
Energy Information Administration
National Energy Information System

Key Activity	Actual Activities During FY 1985	Estimated Activities During FY 1986	Planned Activities During FY 1987
Petroleum Supply Information	Produced weekly, monthly and annual petroleum supply reports. Conducted comprehensive review of data collection instruments and obtained OMB clearance of revised forms. Conducted quality assurance programs. ($5,691,000)	Revise weekly, monthly and annual petroleum supply data surveys to reduce operating costs while maintaining report quality, including utilization of advanced statistical techniques and adoption of data protection. Decrease quality monitoring and survey follow-up activities. ($4,893,000)	Continue to produce and publish basic weekly, monthly and annual petroleum supply statistics. Complete three-year development of error detection/correction methodologies to increase operating efficiencies. ($5,040,000)
Reserves and Natural Gas Information	Produced annual report on reserves and production of crude oil, natural gas, and natural gas liquids and monthly reports on natural gas supplies, disposition, and prices. Conducted selected analyses of key natural gas issues. Initiated study of natural gas contracts to meet Congressional request. Conducted analysis of critical natural gas and petroleum resource issues. ($4,452,000)	Continue to produce monthly and annual data series. Continue integration of monthly and annual data systems. Conduct the natural gas contracts study. Continue to study other major resource issues. Curtail quality maintenance activities related to analysis. Decrease costs for producing annual reserves report with reduced contract costs. ($3,547,000)	Continue to produce basic energy data series. Provide limited analytical support to other Departmental elements. Complete the integrated natural gas data base. Update natural gas supply analysis to reflect changing regulatory environment. ($3,754,000)

DEPARTMENT OF ENERGY
FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST
KEY ACTIVITY SUMMARY
Energy Information Administration
National Energy Information System

Key Activities	Actual Activities During FY 1985	Estimated Activities During FY 1986	Planned Activities During FY 1987
Petroleum Marketing Information	Conducted monthly and annual data collection surveys concerning petroleum product sales and prices. Updated sample frames. Funded heating oil grant program. Conducted quality assurance program. ($3,775,000)	Continue to operate basic petroleum marketing surveys. Conduct sample rotation and recalculate estimation ratios. Reinstitute distillate and residual fuel oil sales survey. Fund heating oil grant program Scale back data consolidation effort. ($3,827,000)	Continue to produce basic petroleum marketing data series. Eliminate frames coverage for diesel kerosene, and propane supplies. Abandon petroleum marketing data consolidation effort. Discontinue heating oil grant program funding. ($3,585,000)
Coal Information	Collected and produced weekly, monthly, quarterly, and annual statistical reports. Completed data interpretations and analyses on key coal issues. Conducted scheduled quality maintenance activities and funded catch-up quality assurance activities as well as ongoing quality monitoring. ($1,557,000)	Continue basic data and analysis efforts. Reduce quality maintenance activities. Maintain historical data bases. Conduct limited analyses of coal supply, transportation, and exports. Develop coal imports monitoring program in response to new legislative requirement. ($1,116,000)	Continue to maintain historical data bases and produce basic energy data series. Conduct limited coal analyses. Produce coal imports data. Delay production of comprehensive quarterly coal distribution report and annual coal production report. Reduce coal model maintenance and updates and defer quality maintenance, particularly require ments analysis, for existing data programs. ($923,000)

DEPARTMENT OF ENERGY
FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST
KEY ACTIVITY SUMMARY
Energy Information Administration
National Energy Information System

Key Activity	Actual Activities During FY 1985	Estimated Activities During FY 1986	Planned Activities During FY 1987
Electric Power Information	Produced monthly, quarterly and annual reports on all aspects of electric power. Provided support to numerous external users. Developed comprehensive operations, technology, and financial analysis program for the electric power area. Funded quality assurance program. ($3,234,000)	Continue to produce reports and develop electric power projections. Defer quality maintenance projects, including model documentation and data updates for financial model. Bulk of reductions due to cancellation of operations and technology data analysis development effort. ($1,946,000)	Continue basic data and analysis program, and support to other agencies. Defer quality maintenance projects and defer effort to develop an integrated financial analysis capability. ($1,786,000)
Alternate Fuels Information	Collected solar collector manufacturing data and produced wood energy consumption report. ($242,000)	Discontinue all alternate fuels reports. Maintain minimal staffing to monitor activities in the alternate fuels area. ($0)	Maintain minimal awareness of activities in the alternate fuels area. ($0)
Nuclear Information	Produced data concerning nuclear fuels for statistical reports and analyses. Conducted uranium industry viability analysis and gathered data concerning nuclear waste disposal. ($1,211,000)	Continue to produce basic information and projections. Conduct uranium viability program using FY 1985 funds. Provide support to other DOE components. Support the Department's nuclear waste management activities. Cancel coal versus nuclear plant costs study. ($850,000)	Produce basic nuclear energy data and key analysis. First year of EIA funding ($500,000) of the uranium industry viability program. Continue to support the Department's nuclear waste management program. Decrease nuclear fuel cycle analysis. ($1,280,000)

DEPARTMENT OF ENERGY
FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST
KEY ACTIVITY SUMMARY
Energy Information Administration
National Energy Information System

Key Activity	Actual Activities During FY 1985	Estimated Activities During FY 1986	Planned Activities During FY 1987
Integrated and Economic Energy Information	Produced EIA's baseline energy forecasts. Prepared integrated energy statistical publications. Conducted energy industry financial analysis, including the Financial Reporting System. Responded to requests for analysis of current energy issues including a study of the impact of tax proposals on the energy industry. Operated State Energy Data System and State Energy Price and Expenditures Data System. Completed model update and enhancements for short term forecasts and commercial and residential energy end use. Performed quality assurance and quality maintenance activities. ($1,708,000)	Continue to produce baseline integrated energy forecasts and monthly and annual integrated energy statistics. Develop automated linkages to energy source data bases. Continue Financial Reporting System, State Energy Data System, and Energy Price and Expenditures Data System. Reduce funding for special analyses in response to ad hoc requests and for model updates and maintenance. ($1,270,000)	Continue to produce baseline energy forecasts. Defer model updating and maintenance. Produce monthly and annual integrated historical data Defer quality maintenance activities. Eliminate Financial Reporting System State Energy Data System, and State Energy Price Expenditures Data System. Perform energy industry financial and tax analysis using results of FY 1986 data collection and publicly available data. ($862,000)
Energy End Use Information	Funded Manufacturing Energy Consumption Survey. Conducted industrial oxides emissions study. Performed quality assurance and quality maintenance activities. Assisted Social Security Administration (SSA) in administering the Low Income Home Energy Assistance Program. ($1,899,000)	Fund the Non-Residential Buildings Energy Consumption Survey (NBECS). Begin compiling results of Manufacturing Energy Consumption Survey. Perform needed quality maintenance activities. Continue SSA support. ($2,632,000)	Fund the Residential Energy Consumption Survey (RECS). Begin compiling results of Non-Residential Buildings Energy Consumption Survey. Continue SSA support. Funding decrease due to the fact that RECS a less complex and therefo less costly survey than NBECS to implement and analyze. ($2,315,000)

DEPARTMENT OF ENERGY
FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST
KEY ACTIVITY SUMMARY
Energy Information Administration
National Energy Information System

Key Activity	Actual Activities During FY 1985	Estimated Activities During FY 1986	Planned Activities During FY 1987
International & Contingency Information	Collected and published information concerning international energy activities. Provided information and analysis to support contingency planning in the Department and by interagency groups. Maintained and documented all contingency planning models. Provided support for International Energy Agency emergency testing. Monitored international activities and provided special reports as needed on timely issues. ($489,000)	Continue to produce basic information concerning international energy activities and monitor the energy situation. Provide contingency analysis to DOE, interagency committees, and the International Energy Agency. Curtail other support for the Department's contingency planning. ($460,000)	Continue international energy data and analysis program. Maintain and document contingency planning models. ($493,000)
ADP Services	Began replacement of IBM mainframe and peripheral equipment. Continued publications automation. Managed ADP contracts. Provided computer services to FERC and other DOE Offices on a reimbursable basis. ($7,297,000)	Continuation of FY 1985 activities with full year funding associated with equipment replacement. ($9,336,000)	Continuation of FY 1986 activities with the exception of altering the schedule for some planned purchases of peripheral computer and telecommunications equipment. ($8,527,000)
National Energy Information Center	Performed editorial and graphics preparation and dissemination activities for all EIA information products. Responded to public inquiries. Microfilmed EIA documents. Maintained EIA mailing lists. ($771,000)	Continuation of FY 1985 activities with reduced levels for microfilming and document indexing. ($733,000)	Continuation of FY 1986 activities with reduced levels for microfilming, publications support, and mail list maintenance. ($604,000)

DEPARTMENT OF ENERGY
FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST
KEY ACTIVITY SUMMARY
Energy Information Administration
National Energy Information System

Key Activity	Actual Activities During FY 1985	Estimated Activities During FY 1986	Planned Activities During FY 1987
Statistical Standards	Developed standards for statistical integrity and monitored conformance with standards. Coordinated EIA advisory support. Conducted quality audits of data systems and computer models (funded by affected program offices). Conducted design, review, and clearance of data collection forms. Monitored the respondent burden control program. ($255,000)	Assume funding for quality assurance activities previously funded by program offices. Continue standards development, survey design, review, and clearance, quality audits, and advisory liaison activities. Maintain Data Resources Directory. Fund independent expert reviews of major studies. ($879,000)	Operate forms clearance and burden control programs at FY 1986 level. Postpone publication of a Handbook of Methods. Reduce activity in model quality audits. ($855,000)
Program Direction	Provided funds for salaries, benefits, and travel for National Energy Information System staff. ($19,484,000)	Continuation of FY 1985 activities with decreased FTE funding due to large number of unfilled positions at beginning of year and the impact of the Gramm-Rudman-Hollings reductions. ($18,512,000)	Continuation of FY 1986 activities. ($19,104,000)

Energy Information Administration
Energy Information
(Tabular dollars in thousands, narrative in whole dollars)

	FY 1985 Approp.	FY 1986 Approp.	FY 1987 Base	FY 1987 Request	Request vs. Base
Policy and Management					
Operating Expenses:					
Program Support	$ 224	$ 441	$ 565	$322	- 243
Program Direction	8,630	7,282	7,618	10,201	+ 2,583
Total, Policy and Management (P&M)	$8,854	$7,723	$8,183	$10,523	+$2,340
Staffing, P&M FTE:					
Direct	34	33	34	34	
Reimbursable	0	0	0	0	

Authorization: P.L.'s 75-688, 93-319, 94-963, 94-385, 95-619, 95-620, 95-621, 96-102, 96-294, 97-257, & 95-91; & 16 U.S.C. 791a et. seq.

Summary of Changes
Policy and Management
(Dollars in thousands)

FY 1986 Appropriation Enacted	$8,070
Balanced Budget and Emergency Deficit Control Act adjustment	- 347
FY 1986 Budget Authority	$7,723
Within-Grades, Promotions, Awards, Increased Contribution to Retirement and Benefits	+ 41
Contract, Travel, and Training Inflation	+ 268
Contract Award Fees	+ 105
Shift of 1 FTE from NEIS	+ 46
FY 1987 Base	$8,183
Program Increases:	
Administrative Support Services Provided by M&A	+2,583
Program Decreases:	
Systems Integration Activities	- 155
Planning and Management	- 88
FY 1987 Request	$10,523

Policy and management provides resources for the central management, guidance, and coordination of all EIA activities. The FY 1987 request is $10,523,000 and 34 FTE, an increase of $2,340,000 and 1 FTE over the FY 1987 base level. The Administrator of the Energy Information Administration is responsible for providing relevant, high quality, and timely energy information to the Executive Branch, Congress, State governments, and the public. The Administrator is also responsible for providing energy data, analysis, and processing support to other DOE components, and for preparation of regularly scheduled and special purpose energy forecasts and analyses, and for supporting departmental contingency planning and emergency operations. The Administrator is supported by a Deputy Administrator, an immediate staff, and the Office of Planning and Resources.

The **Office of Planning and Resources** manages overall EIA program planning and evaluation, project control, budgeting, and procurement; performs organization and management analysis; and provides personnel management and logistical support services. The Office also monitors and coordinates all General Accounting Office and Professional Audit Review Team activities, tracks legislation for energy information implications, prepares and coordinates Congressional testimony, and handles the disclosure of sensitive company-submitted information.

The level of funding requested for FY 1987 reflects both some savings and some cost increases. Planned improvements on automated management tracking systems will not be made at this funding level and annual and multi-year planning activities will be reduced, for a total savings of $88,000. Systems integration studies totalling $155,000 will be eliminated. Funding for program direction will increase from the FY 1987 base level of $7,618,000 to $10,201,000 to meet the administrative support requirements estimated by the Assistant Secretary for Management and Administration.

Personnel Resources

	FY 1985	FY 1986	FY 1987
Total Policy and Management	34	33	34

Anticipated Workload - Policy and Management*

	FY 1985	FY 1986	FY 1987
Program plans	3	3	2
Budgets	3	3	3
Financial plans	12	12	12
Space plans, telephone services, and other ad hoc requests	556	550	500
Travel requests	375	375	375
Printing requests	200	200	200
Correspondence and project tracking	600	600	600
Personnel actions and training requests processed	800	800	800
Contract actions processed	950	900	900

* Workload indicators do not take into account varying complexity factors (e.g. a contract action may involve a new task assignment to develop a large computer processing system or may involve a simple modification to an ongoing task); therefore, units are not necessarily comparable.

DEPARTMENT OF ENERGY
FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST
KEY ACTIVITY SUMMARY
Energy Information Administration
Policy and Management

Key Activity	Actual Activities During FY 1985	Estimated Activities During FY 1986	Planned Activities During FY 1987
Planning and Resource Management	Developed EIA program plans and annual and multi-year operating plans. Prepared internal review budget, OMB budget, Congressional budget, and related testimony and hearing material. Executed budget. Processed and monitored contract actions. Operated and maintained automated management tracking system ($224,000)	Continuation of FY 1985 activities. Perform systems integration studies. ($441,000)	Investigate feasibility of continued systems integration activities. Continuation of other FY 1986 activities with reduction in planning activities. Deferral of planned improvements to automated management tracking systems. ($322,000)
Program Direction	Provided funds for salaries, benefits, and travel for Policy and Management staff. Provided funds for all EIA staff training. Provided administrative support to Dallas Field Office. Provided funds to Department for space rental, utilities, communications, supplies, and other support services. ($8,630,000)	Continuation of FY 1985 activities with 10 percent reduction in administrative support funding per OMB Order. ($7,282,000)	Continuation of funding for Policy and Management salaries, benefits, and travel, EIA training, and support to Dallas Field Office. Increase funding for Departmental administrative support funding. ($10,201,000)